

The Canadian Medical Association Journal

Vol. 34

TORONTO, MAY, 1936

No. 5

CLINICAL AND OTHER OBSERVATIONS ON CANADIAN ESKIMOS IN THE EASTERN ARCTIC*

By I. M. RABINOWITCH,

Montreal

THE purpose of this communication is to summarize briefly the clinical and metabolic findings of an investigation of Eskimos in the Canadian Eastern Arctic made during the Canadian Government Eastern Arctic Patrol of 1935. The metabolic findings, in detail, form the subject-matter of another report (in press).

Two different interests prompted this investigation. The purpose of the Canadian Government was to determine the general health of the Eskimos; whether contact with civilization is causing their deterioration; and, if so, the causes. Quite frankly, this was not the writer's interest. If there was a serious health problem amongst the Eskimos he was not aware of it. His interest was primarily in the alleged absence of diabetes, cancer, and arteriosclerosis, and the possible relationship between such absence and the peculiar dietary habits of these people. However, as will be seen, the necessary methods of investigation were essentially the same.

The data include general physical examinations; routine urinalyses (albumin, sugar, acetone, etc.); red and white blood cell counts; hæmoglobin determinations and blood smear studies; Wassermann and Kahn tests, and x-ray examinations of the lower extremities for calcification of the arteries. The metabolic data include general blood chemistry (non-protein nitrogen, urea, creatinine, uric acid, amino-acids, sugar, chloride, lipoids, etc.); blood sugar time curves following ingestion of glucose; analysis of blood lipoids; basal metabolism tests, and respiratory quotients obtained before and after administration of fat meals. The chemical examinations of the urine include chloride and nitrogen determinations and analyses of inorganic constituents (lead, copper, etc.). Urines were also examined spectrographically by

the Physics Department of McGill University. The food analyses include determinations of food values and of inorganic constituents (copper, lead, etc.). Chemical analyses were also made of sea water collected at 25 different points at sea and in port. X-ray films were obtained of skulls for Dr. Mortimer, of the Department of Biochemistry, McGill University, for his endocrine studies.

The findings should be reasonably representative of the health conditions in the Eastern Arctic. The areas of four of the islands which we visited—Southampton, Baffin, Devon and Ellesmere—account for approximately 70 per cent of the total area of the principal islands in the Eastern Arctic. The population is also well represented. The combined statistics of the Royal Canadian Mounted Police, traders, medical officers, and missionaries, show that there are approximately 2,400 Eskimo in the Eastern Arctic, and, in the four islands I have just mentioned there are about 950 natives. Therefore, the Eskimos of these four islands account for about 40 per cent of the total Eskimo population in the Eastern Arctic. In all 389 Eskimos were examined, 267 of whom, or approximately 68 per cent, were in these four islands. In Baffin Island alone, which accounts for almost one-half of the total area of the principal islands in the Eastern Arctic and about one-third of the total population, the writer visited five ports—Cape Dorset, Lake Harbour, Pangnirtung, Pond Inlet and Clyde River—and examined 203 natives, or approximately 25 per cent of the total population. The natives found at Dundas and Craig Harbours represented the total population of Devon and Ellesmere Islands, which in area account for

* A portion of the material on the investigation of which this report is based was collected by Dr. C. C. Birchard in Hudson Strait and on Quebec shores of Hudson's Bay.

approximately 95,000 square miles, or slightly over one-fifth of the total area of the principal islands in the Eastern Arctic north of Hudson's Bay.

It is necessary, however, to point out the limitations of the data. In order not to get caught in the ice and be forced to winter in the Arctic, the ship, which carries the annual supplies for the Hudson's Bay Company's posts, the police, and the missionaries to these regions of Canada, must travel approximately 10,000 miles at an average speed of about 9 knots only; must discharge cargo at about 20 ports and depend upon tides to enter and leave each port, and all of this must be accomplished within the short period of about two months. Actually, in 1935, allowing for the time it took the *Nascopie* to reach Port Burwell, the eastern entrance to Hudson's Bay, from Montreal, the duration of the voyage was two months. The *Nascopie* first reached Port Burwell on July 23rd, and on its return journey again docked at Port Burwell on September 22nd. It is obvious, therefore, that the time we could possibly have spent at any one port must have been very short. It is failure to recognize this fact which has, in my opinion, led to so much misinformation regarding not only the Eskimo but also those who, directly or indirectly, were responsible for his welfare.

The difficulties in obtaining information were not the same in every port. Not all the Eskimos are dependent upon the annual fleeting visit of physicians who accompany the patrol ship. At Chesterfield Inlet, on the northwest shore of Hudson's Bay, there is the Catholic Mission hospital, and at Pangnirtung, in Cumberland Sound, on Baffin Island, there is the Anglican Mission hospital. Both of these hospitals were built and equipped by the missionaries, and are supported by the Dominion Government, which, I was told, contributes not only towards the maintenance of physicians and nursing staffs but also towards indigent patients. The hospital at Chesterfield, a three-storey structure with accommodation for 40 to 50 beds, is under the direction of Bishop A. Turquetil. The staff here consists of Dr. L. D. Livingstone and two Sisters. The hospital is very well organized. Some idea of the organization may be gained from experiences with some of the metabolism tests. The intention was to obtain 5 blood

sugar time curves. When I arrived on the morning the tests were to be made the Eskimos had been properly prepared for the tests (fasting, etc.), and were in bed, and all of the 5 tests, which involved collection of 25 blood samples, were done in the one morning.

The Pangnirtung hospital is under the direction of Right Rev. A. L. Fleming, Anglican Bishop of the Arctic, and the staff consists of Dr. A. G. MacKinnon, a nurse, and a matron. This hospital is very well equipped for x-ray work. In one short morning, with the assistance of Dr. MacKinnon, Rev. A. G. Turner, the Missioner, the matron and the nurse, 24 Eskimos were collected and films were obtained of their lower extremities for examination for calcification of the arteries.

In order to determine whether contact with civilization is causing deterioration of the Eskimo, consideration had to be given to a variety of factors, and one of these was the mode of life. Conditions of life are so varied in the Eastern Arctic that the influence of civilization should, theoretically, be a simple matter to determine. Practically, however, there are many difficulties, and experiences with Eskimos elsewhere are of very limited value, since it is obvious from the literature alone that, though ethnologically there is much in common between all Eskimos, those of the Eastern Arctic differ in mode of life and customs from those of Coronation Gulf, and the Eskimos of Coronation Gulf differ appreciably from those of the Western Arctic. The problem, however, is simplified to some extent by the fact that in the Eastern Arctic alone the conditions under which the Eskimos live are many. The conditions which obtain in Hudson's Bay and Straits differ quite appreciably from those of the more northern parts of Baffin Island and Devon Island; and, though one would expect, theoretically, that the Eskimos at the latitude of Craig Harbour on Ellesmere Island would live under the most primitive conditions, this is not so. These Eskimos are employed by the Police, and live in huts for a great part of the year. Their food and clothing are also to some extent the products of civilization, but the conditions under which they live are exceptionally good. The Police rigidly supervise the cleanliness of the huts and laziness is not permitted. The food supplied by the Police



Fig. 1.—*R.M.S. Nascopie* on July 24, 1935, in Hudson Strait.

Photo by Dr. C. C. Birchard (courtesy of the *McGill News*).

Temperature on same day in Montreal, maximum 85.5 deg.; minimum, 71 deg.

must be supplemented by the natural foods of their environment—seal, etc. These Eskimos still spend much time hunting.

An example of the difficulties of correlating living conditions with health may be seen in the writer's attempt to relate the latter to the various proportions of skin and canvas tents, of motor boats and kyaks, of fur clothes and those made of cotton, etc. The tents found at the Posts when the ship arrived were, with extremely few exceptions, not permanent structures. Except for the few native employees of the Hudson's Bay Company, police, and missionaries, the great majority of Eskimos lead a nomadic life; some trap, others hunt, and few only ordinarily live at the Post. For example, at Clyde River on Baffin Island, though the Canadian Government statistics give the Eskimo population as 32, the writer saw 11 only of the natives; and at Pond Inlet, though the population is recorded as 131, there were 31 only.

Interpretation of clothes is no less difficult. Thus, though some of the natives may wear

cloth materials on festive occasions, such as on the arrival of a ship, these, I was told, are, as a rule, soon discarded when the ship leaves. Weather is also an important factor. An example of this was met with at Pangnirtung. On the first day, the majority of the natives were dressed in cloth materials; with the change in the weather the following day—with the decrease of temperature and rain—the cloth materials practically disappeared and the great majority of the natives appeared in their native seal-skin clothes. At Lake Harbour there was a cold drizzle all day, and, with one exception only, all of the natives were dressed in seal-skin.

Food afforded a better indication of the living conditions. In Hudson's Bay, for example, at Chesterfield Inlet, hunting conditions are poor and flour was very common; it was found in eight of nineteen tents visited; whereas, in the same Bay, at Coral Harbour on Southampton Island, where seal hunting is good near the Post, though the natives must go a little farther for walrus, flour was found in one only of the eight tents visited. At Wolstenholme, the

western entrance to the Bay, the natives must hunt quite a distance from the Post and, here, of nine tents, four contained flour. The same conditions were met with in the Straits. Thus, at Cape Dorset on Baffin Island hunting is very good close to the Post, and Salisbury Island, a very good place for walrus, is not very distant. Here, of fourteen tents visited, flour was found in two only. At Lake Harbour, seals, I was told, are found in abundance about eight miles from the Post; walrus are also available within a short distance, and, here, of twenty-six tents, flour was found in one only; whereas, at Port Burwell, where, aside from very intimate contact with white men throughout the year, hunting conditions are poor for seal and walrus, flour was found in all of the nine tents visited. Data with

regard to flour alone are, however, not entirely satisfactory. Thus, although flour was found in one tent only at Lake Harbour, the average annual consumption at this Post, I was told, is about 130 pounds for an average family of three people. This, however, it will be noted, corresponds to less than two ounces per day per person. At Dundas Harbour, the two natives who were selected to test the influence of fat meals (soya bean oil) upon the respiratory quotient had had, according to the interpreter, no flour whatever for three weeks before the tests. Meat was found in all of the tents at Pond Inlet and in nearly all at Pangnirtung.

In general, the men were found to be healthier than the women; but the majority of men were at work outside of the tents, whereas the ma-



jority of the women were found in the tents. As a rule, the men found at the shores were in better health than those found about the tents; and when the hunters were separated from the trappers the former were, in general, healthier than the latter. Here, food is obviously an important factor. The food of the hunter is generally seal, walrus, whale, birds, etc.; whereas, I was told, the trapper must rely to an appreciable extent upon such foods as caribou, dried buffalo meat, etc., with an occasional supply of seal.

DISEASES AMONGST ESKIMOS

A very striking example of the influence of contact with civilized man is seen when the diseases met with in Hudson's Bay and Straits are compared with those of the more northerly regions of the Eastern Arctic. Chesterfield and Port Burwell are the Port Said and Bombay of the Eastern Arctic. The majority of the natives at these posts were pale (according to the hæmatological findings there is reason to suspect that one of them had pernicious anæmia), whereas in the northern parts of Baffin Island, Devon and Ellesmere Islands, the colours of the skins and mucous membranes were not only good but many of the natives looked plethoric. A number had epistaxis, which in a number of cases was subsequently found to be due to polycythæmia. This polycythæmia appears to be "symptomatic", since, though there were the usual features—suggestive cyanosis, high red cell counts, high hæmoglobin values, high cell-plasma ratios, hypertension and occasional headache—none of the spleens was palpable nor enlarged to percussion. It would appear that polycythæmia is also common amongst Greenland Eskimos. Mrs. J. O. B. Petersen has told the writer that she has often seen "rings of blood" about the nostrils of the natives. It is also of interest to note that venesection, a common procedure for the relief of polycythæmia vera, is also practised by the Eskimos. They perform the operation upon one another in the ante-cubital area; the writer saw a number of what appeared to be the tell-tale scars.

There were 38 cases of epistaxis, but, unfortunately, the cause was not suspected for some time; also conditions did not permit collection of complete data in all of the known cases. The following, however, is a summary of

the blood pressures, hæmoglobin determinations, and cell-plasma ratios in 8 of the cases with epistaxis in which all examinations were made.

	<i>Maximum</i>	<i>Minimum</i>	<i>Average</i>
Blood pressure: systolic	172	132	140
diastolic	90	74	83
Hæmoglobin (per cent)	165	135	145
Cell-plasma ratio	2.21	1.45	1.85

Aside from their clinical interest, these cases are of interest from the point of view of the physiology of the formation of hæmoglobin. Is the excess production of hæmoglobin due to copper? In general, as is well known, marine life is richer in this element than land animals. It is for this reason that analyses of foods and urines for copper contents were included in the metabolic studies. It is of interest to note that, compared with the findings at Pangnirtung and the more northerly posts, signs of polycythæmia were very uncommon in the Straits and Bay; and this fits in with the urinary excretion of copper.

Tuberculosis was common in the Straits and Bay. At Chesterfield Inlet, of 62 persons examined 22 had some respiratory disturbance; and of these 12 had coughs with no detectable adventitious sounds in the lungs; 2 had what appeared to be bronchitis only; and 8 had active pulmonary tuberculosis. In addition to these 8 cases, active glandular tuberculosis (cervical) was found in 4 children. At Port Burwell, of 31 natives examined 8 had coughs with no detectable adventitious sounds; 2 had what appeared to be bronchitis; and 5 adults had active pulmonary tuberculosis. Two children had masses of confluent glands in the neck. There was one case of tuberculosis of bone (phalanx); there was no reason to suspect lues in this case. At Coral Harbour there was a child with tuberculosis of a knee joint. Two cases of active pulmonary tuberculosis were found at Lake Harbour. At Wolstenholme one child was found with a mass of confluent glands in the neck. No clinical tuberculosis was found at Cape Dorset. As we travelled north, a number of cases of pulmonary tuberculosis in adults and enlarged cervical lymph-glands in children were found at Pangnirtung, on lower Baffin Island. This fitted in with the experiences of Dr. MacKinnon. Among an excellent collection of 100 case reports which Dr.

MacKinnon showed the writer there were 7 cases of pulmonary tuberculosis, and in 13 of this group there was a family history of the disease. No evidence, however, was found of the disease at Clyde River; Pond Inlet and Dundas Harbour on Devon Island. At Craig Harbour on Ellesmere Island, the natives were exceptionally healthy.

The teeth afford further proof of the harmful effects of civilization. They very strikingly differentiate the Eskimos of the Straits and Bay from those of the more northerly regions. In the Bay and Straits many were quite clean, and the reason was obvious; they had been brushed. At Port Burwell I found a tooth brush resting on a boulder about 20 feet in front of a tent. Cleanliness is, however, not necessarily synonymous with healthy teeth; the highest incidence of caries and pyorrhœa was found at Chesterfield and Port Burwell. At the latter Post, of 31 natives examined 16 had very poor teeth. Dr. A. L. Richard, the ship's physician, told the writer that he had extracted 32 teeth in one afternoon at Chimo, and that, in all, he extracted 50. As we travelled north the teeth were found in a much filthier state, but they were very much healthier. The only disturbing finding in these regions was the severity of the abrasions, particularly in the women, with many teeth worn to the gum-lines. This condition will be referred to again.

Our data, I believe, definitely disprove the alleged absence of arteriosclerosis amongst the Eskimo, at least in the Eastern Arctic. According to Dr. J. G. Townsend, Director of Health of the Department of the Interior of the United States, the Eskimo in Alaska is apparently free of arteriosclerosis (personal communication). Dr. J. A. Urquhart, at Aklavik, N.W.T., also has the impression it is rare amongst the Eskimo in the Western Arctic of Canada (personal communication) and, in his paper (this *Journal*, 1935, 33: 193) he states that chronic nephritis is very rare. This certainly does not apply to the Eastern Arctic. Again, the experiences in the Bay and Straits differed from those of the more northerly regions; in the former I saw 1 case of hemiplegia and 6 of marked retinal arteriosclerosis. Thickened radial and tortuous temporal vessels were common, and in 34 cases the blood pressures were greater than 150 mm. Hg.; whereas, aside from increase

of blood pressure in 5 of the cases of polycythæmia, clinical evidence of arteriosclerosis was found in 6 cases only amongst all of the Eskimos examined at Pangnirtung, and no evidence of the disease was found at Clyde River, Pond Inlet, Dundas and Craig Harbours.

The above findings fit in with the x-ray examinations. Of 39 films of Eskimos taken in Hudson's Bay and Straits by Dr. Birchard 19 showed definite calcification of the arteries, an incidence of 48.7 per cent; whereas, of 24 films on Baffin Island, 4 only showed calcification, an incidence of 16.6 per cent, in spite of the fact that the average age of the Hudson's Bay and Straits group was 44.6 years, whereas, that of the Baffin Island group was 50.0 years. These findings, incidentally, fit in with experiences with albuminuria. Of 75 urines examined for albumin, 37 were of Eskimos in Hudson's Bay and Straits and 38 in the more northerly regions. Nine, in all, had albuminuria, and of these 9 all, with one exception, were from Hudson's Bay and Straits.

The Eskimo is of interest from the point of view of the etiology of arteriosclerosis. As will presently be seen, venereal disease appears to be rare. Syphilis, therefore, can hardly be a very important factor. Diabetes, as will presently be seen, is also excluded, and, though chemical composition of blood does not alone exclude gout, it is of interest to note that all of the uric acid values were within the normal limits. The Eskimo disturbs our ideas about the importance of strenuous life, in view of the fact that no arteriosclerosis was found at Clyde River, Pond Inlet and Dundas Harbour. The Eskimo also disturbs our ideas about high protein diets. When food is abundant a healthy Eskimo living under primitive conditions will eat 5 to 10 pounds of meat or more a day; and the greatest meat eaters are at Pangnirtung, Clyde River, Pond Inlet and Dundas Harbour.

Is lead a factor? As is well known, disease of the vascular system is the outstanding pathological lesion in chronic lead poisoning, and lead is almost invariably found in the urine of normal people; we pay very little attention to as much as 0.1 mg. per litre. The examinations of the Eskimo urine are, therefore, of more than academic interest. No lead whatever was found in 24 specimens examined spectrographically by Dr. John S. Foster, of the

Physics Department of McGill University, in spite of the fact that, with the method used, as little as 0.0000005 g. of lead per c.c. of urine may be detected with very little difficulty. It would appear, therefore, that lead is not the explanation of the high incidence of arteriosclerosis which was found in Hudson's Bay and Straits.

A variety of illnesses were met with, in isolated instances. There was one case of pituitary disease with exophthalmos; one of rheumatoid arthritis, and one of hydrocephalus in a child; there were 4 cases of cataract, 1 of epilepsy, and 1 of insanity. There were no signs of any heart disease, though in one case, at Dundas Harbour I found an apical systolic murmur. There was no evidence of tonsillitis. All the tonsils had healthy pink surfaces, and no pus was found with the ordinary pressure with a tongue depressor.

In the Western Arctic Dr. Urquhart has as yet not met with a single case of cancer in the seven years of his practice. Cancer must be extremely rare in the Eastern Arctic also. I saw one suspicious case only, in a male aged approximately 60 years, at Cape Dorset. According to the interpreter the lesion (lower lip) was about two years old. It bled rather easily, and there was some induration about it. There was, however, no enlargement of the glands in the neck, in spite of the duration of the lesion. The man did not smoke a pipe.

There was no clinical evidence of diabetes mellitus, and, of all of the urines examined, 3 only contained reducing substances, but the latter were subsequently found to be non-fermentable. One of the natives at Pond Inlet had a carbuncle on his neck, but there was no glycosuria. Nor were there any acetone bodies in any of the urines. This, however, in my opinion, is no mystery. These people do not live upon as pure a fat-protein diet as is generally believed. The Eskimo has some carbohydrates for approximately two months in the year, in the form of blueberries. He also relishes the stomach contents of the caribou, which, throughout the year, contain carbohydrates, though the greater part is probably not utilizable as far as the human being is concerned (celluloses, hemicelluloses, hexosans, pentosans, etc.). (The stomach contents are often eaten with seal oil — a salad!) When an

Eskimo catches a walrus he immediately opens the stomach and eats all of the clams, which have some glycogen. He also relishes the skin of the whale and narwhal, both of which are rich in glycogen, and he eats enormous quantities of meat. The Eskimos eat the livers of practically all animals, except that of the white bear. These are rich in glycogen. As stated above, when food is abundant a healthy adult will eat 5 to 10 or more pounds of meat a day, and, only when in need does he consume very large quantities of fat. Blubber is not regarded as a delicacy. It is also of interest to note that, though whale, walrus and seal have enormous layers of blubber, the accumulations of fat in the musculature seen in some land animals are practically unknown; the meat is, therefore, lean. When consideration is given to these facts and to the additional fact that about 58 per cent of protein is convertible into sugar, it is obvious that the ratio of fatty-acid to glucose is well below the generally accepted level of ketogenesis. I estimate that when food is abundant, the average daily diet of the adult Eskimo consists approximately of 30 to 40 grams of carbohydrate (which includes glycogen), 250 to 300 grams of protein, and about 150 grams of fat ($FA/G=1.2$). These amounts of meat are apparently not heroic, for it has been alleged that the Yakuts, on the Low Steppe, east of the Lena, eat as much as 25 and 30 pounds of meat a day. Parenthetically, it may be observed that, from the metabolic point of view, it would appear that many of the Eskimos are now in greater danger of alkalosis than acidosis, because of their practices with flour. The "bannock", which some eat in large quantities when finances permit, is essentially a mixture of flour and baking soda, and the Eskimo, according to the amounts which I saw used, has no sense whatever of the necessary relative proportions of flour and baking soda for the preparation of this food.

No definite evidence of clinical syphilis was found anywhere. There were 5 suspicious cases at Pangnirtung, on Baffin Island, and one at Dundas Harbour, on Devon Island. Of the former, a positive Wassermann reaction was found in one only; in the case at Dundas Harbour the reaction was positive. Of 26 other samples of blood collected at random, none was

positive. Nor was there any evidence at least of active gonorrhœa.

My observations on sterility are of interest here. It has been alleged that sterility is common amongst the Eskimo and that it is on the increase. Limited significance must be attached to the data, in view of the smallness of the numbers. It is, however, of interest to note that of 107 women, selected at random, but with husbands alive, 8 only had no children, and, of these 8, three had not as yet reached the menopause. The incidence of sterility, therefore, does not appear to be greater than amongst civilized peoples.* Combining all of the data, venereal disease, therefore, must be rare amongst the Eskimo, and this is undoubtedly due to the rigid police regulations with regard to their own men and the rigid and very wise policy of the Hudson's Bay Company with regard to the permission of the ship's crew to go ashore. It is of interest to note that, according to Dr. Urquhart, venereal disease is practically non-existent in the Western Arctic. Parenthetically, experiences in this investigation afford a good example of the importance not only of expert interpreters but also of a knowledge of the customs of the people. No cases whatever of sterility would have been discovered had the questions merely been—Are you married? and—Have you any children? Whenever the replies to both questions were in the affirmative, the next question had to be—Are these children your own?—since the practice of adopting children is very common; of the 107 families, selected at random, 24 had adopted children.

The hæmatological data are of interest. From reports of the Institute of Parasitology of McGill University by Drs. T. W. M. Cameron and I. W. Parnell it is obvious that the Eskimo is exposed to a variety of parasitic infections. These authors have found that at least three-quarters of all of the animals examined, birds, duck, geese, etc., harboured parasites. The polar bear, walrus, and weasel were found free, but most of the seals examined were infected with *Ascarides* and intestinal flukes. The Eskimo lives in intimate contact with his dogs,

and carcasses and fæces of these animals are heavily parasitized with hookworm, *Ascarides*, flukes, and tape worms. *Ascarides*, tænia and hookworm were found as far north as Craig Harbour, and hares from Ellesmere Island were heavily infected with worms. Nail scrapings of Eskimos were found high in content of *Oxyuris vermicularis*. Our hæmatological findings are, therefore, as one would expect. Hæmatological studies of 35 blood smears by our hæmatologist, Dr. E. S. Mills, revealed nothing abnormal, except for the above-mentioned suspected case of pernicious anæmia and 3 cases of eosinophilia (5 per cent or more of eosinophiles). Our pathologist, Dr. L. J. Rhea, in his search for parasites found 6 cases of eosinophilia amongst 34 blood smears.

There was no definite evidence of rickets either in the Straits and Bay or in the more northerly regions (there were 3 suspicious cases at Pangnirtung). The absence, or, at least, rarity, of this condition, especially at the latitudes of Clyde River (70°26'), Pond Inlet (72°40'), Dundas Harbour (74°35'), and Craig Harbour (76°12') is instructive when we appreciate the fact that the effectiveness of the sun's rays in the production of vitamin D-like substances decreases towards the Pole. Furthermore, the Eskimo's skin is quite pigmented. This tends to interfere with penetration of the little of the sun's rays which are effective. The reason, however, for the failure to find rickets at the above-mentioned places appears to be that infants are nursed for as much as two years and more, and the fact that the vitamin D-content of seal oil is equal to that of the best cod-liver oil. According to Dr. Urquhart, infants are nursed for very long periods of time amongst the Western Arctic Eskimos also. One of the mothers demonstrated to me that her milk supply was still plentiful, though she was still nursing her child who, according to the interpreter, was now 2½ years old.

The birth of a child at Lake Harbour was an interesting experience. The practice of tying a bed-sheet to the foot of the bed dates back apparently to the Stone Age, for here, a few feet in front of the woman, a huge boulder held down a piece of skin which she pulled at with each attack of pain. From another experience, if I may suggest it, our obstetricians have something to learn from the Eskimo about the mechanics of labour. The child is born with

* In view of the small number of the women questioned these data are, as stated, of limited significance. At Pangnirtung, for example, the majority of natives were away from the Post when the ship arrived, and Dr. MacKinnon told the writer that he knew of a number of cases of sterility. However, it was Dr. MacKinnon's impression that the sterility was due to displacement of the uterus rather than to venereal disease.

the mother in a squatting position. She is supported in this position by three women. One sits in the knee position behind her with both arms over the shoulders of the patient; on each side the other two women sit in the ordinary sitting position and support the shoulders of the patient in front. Birth apparently is not a very painful matter, judging from the expression of this woman as I watched her for some time. Incidentally, though a primipara, the os was fully dilated, though, according to the interpreter, she was in labour for about twelve hours only. Except for the administration of some castor oil and 1 c.c. of pituitrin, my activities, as obstetrician, consisted, as the word implies, in standing-by. The child was born ten minutes after the pituitrin was given, and ten minutes later, all in the tent—11 women, the patient, and the writer—enjoyed cigarettes. Mr. J. A. Thom, one of the Hudson's Bay Company's officials, who has been in the Arctic for sixteen years, told the writer that, according to pagan practice, only women past the menopause are permitted to attend the birth of a child; that things of any appreciable value are removed from the tent before labour commences, in order that they may not be defiled; that all men leave the neighbourhood and go "hunting"; and that the placenta and the menstrual pad of fur are taken some distance from the tent by a group of women and buried under rocks with some ceremony. According to the above observations, these people still retained some of their former beliefs, since no men were about the tent and the tent was practically empty; there were a few cooking utensils and just enough fur to cover the expectant mother; but of the 11 women in the tent a number were obviously still within the child-bearing age. The placenta was tied by one of the women in two places with part of a dog-line and the cord was cut between the ligatures with a knife. As I was told that the mother was a Christian I expected the placenta would be thrown away immediately. It was, however, placed at the back of the tent and covered with a piece of skin; and though I waited in the tent for some time I never saw its ultimate disposal. When the *attataga* (father) learned that his offspring was an *arg-na* (girl) and not an *ung-oon* (boy), he seemed quite disappointed. Mr. George Wat-

son, the Hudson's Bay Company representative on the voyage, was also disappointed in that I failed to produce a trapper!

Amongst the more primitive Eskimos (Pangnirtung, Clyde River, Pond Inlet, on Baffin Island, and Dundas Harbour, on Devon Island) the three most important health problems are the conditions of the eyes and teeth, and the poor resistance to infection.

In the vast majority of eyes examined there was intense congestion of the conjunctivæ, and this, with the marked wrinkling of the forehead, would appear to be due to constant strain. Pterygium was very common, and in a number of cases was bilateral. This also appeared to be due either to strain or dust, but there is apparently another factor since it was found much more frequently in the women. Since the women spend much more of their time in the tents, spasmodic exposure may be a factor. From missionaries, Hudson's Bay officials, and police I learned that snow-blindness was very common during the winter months. Errors of refraction were very common; but particularly of interest was the relative insensitivity to foreign bodies in the eyes. In some of these cases I found foreign bodies as large as a pinhead and in 9 of the 13 cases with foreign bodies the persons concerned were not even aware of them, though in each case these bodies moved about freely and were very easily removed. In a few cases there had been some secondary reactions at an earlier date, since the foreign substances were encysted. In three cases of blindness the foreign bodies were found deeply encysted, and, as the blindness followed attacks of snow-blindness, it would appear that the combined disturbances led to a panophthalmitis. In the Straits and Bay there was good reason to suspect that this relative insensitivity to foreign bodies may be due, in part, to vitamin A deficiency as a result of insufficient fat in the food. The blepharitis, with œdema of the eyelids, the dryness of the conjunctivæ, and the sticky shreds of Meibomian secretions on the lid margins were certainly suggestive. The eyes alone, in my opinion, warrant periodic visits by an ophthalmologist. Correction of errors of refraction would improve the sight, and thus the hunting capacity, of an appreciable number of these people.

Equally important is the condition of the teeth, namely, the marked abrasion. In a letter to the writer, Dr. M. A. Pleasure stated that in the American Museum of Natural History, in New York, amongst the 12,000 skulls there are several hundreds of Eskimos, and that the most interesting of the distinctive features is the extent of the abrasion of the teeth. In asking the writer to seek for the possible cause, Dr. Pleasure pointed out that it is difficult to attribute this condition to the food itself, since



Fig. 2.—Eskimo women softening leather by twisting skins and chewing the twists.

meat tends to be a lubricant rather than an abrasive. There is also the observation that the Indians of the southwestern parts of the United States eat corn ground in sand-stone apparatus. Their food is, therefore, notoriously sandy, and though there is some abrasion it is not nearly so marked as in the skulls of the Eskimo. The food of the Eskimo in the Eastern Arctic is undoubtedly rich in sand. Seals, when caught, are not carried but dragged into the tents. All seal meat, whale, and the other foods which I saw in the tents were on the floor in direct contact with the earth. It is obvious, however, that there are two other contributing factors. Firstly, the Eskimo, at least in the Eastern Arctic, has a prosharmotic (edge to edge) occlusion of his teeth. This alone would account for some abrasion, but the aggravating factor is the practice of chewing leather, and, for this reason, the abrasions are much more marked in the women than in the men. The men apparently confine this practice to the chewing of dog lines; whereas the women have the leather of the entire household to contend with. Our dentist, Dr. W. G. Leahy, sectioned some of these teeth and demonstrated an interesting phenomena; though these

teeth were worn down to the gumline they were otherwise in very good condition, because of a secondary reaction to the abrasion as the result of which there was a new formation of dentine that not only filled the greater part of the root canals but also the pulp cavities. Mrs. Petersen put it very aptly when she referred to this secondary reaction as a "God-sent dentist"!! The writer was told that an attempt had been made to supply the natives with a mechanical leather softener, but the experiment did not prove very successful. The Eskimos certainly do not relish this chewing process, but from experience have learned that their teeth are better fitted for the purpose intended. Saliva may be a factor. The discovery of a method which would soften the leather but not impair its water-proof or durable qualities would be well worth the effort. Much is known of the chemistry and physics of leather in general, and there is no reason to believe that this knowledge does not also apply to seal.



Fig. 3.—Tooth worn to within 1 to 3 mm. of gumline, with secondary dentine projecting into the pulp cavity partially obliterating the root canal.

The Eskimos are a very primitive people with a very primitive culture. Many of their implements, domestic and otherwise, are still those of the Stone Age; and the Eskimo has no sense whatever of sanitation. Food, as I have stated, is placed carelessly on the earthen floor of the tent, and is exposed to innumerable sources of contamination. Refuse is simply thrown out of the tent. The Eskimo also lives in intimate contact with his dogs, which roam about or are leashed near the tent; the excreta of these animals about the tent does not worry these people. I visited a tent during a meal of seal. There were, of course, no in-

dividual knives or forks; everything was eaten by hand. Here, as elsewhere, the seal was on the earthen floor, and the knife, handle as well as blade, was in the abdominal cavity. During the meal some of the meat was cut and the blood soaked knife was again carelessly thrown on to the seal, and, by gravity, again found its way into the abdominal cavity. By the time the meal was finished, the hands and face of all were well covered with blood and blubber. To remove the latter, one of the boys took a handful of water from the common water supply in a stone vessel, rinsed his mouth with it, and then used this rinse-water for his hands and face.

In spite of the above-mentioned practices, however, the Eskimo is remarkably free of infection. This suggests absence of pathogenic organisms, and experiences with decomposed food are further suggestive. When food is plentiful it is cached under rocks for many months. In spite, however, of its highly decomposed state the Eskimo eats it, and apparently with no impairment of health. This cannot be due to immunity of the Eskimo against the *Salmonella* group of organisms, because I had been told by Mr. Thom that he had to eat such meat a number of times and never suffered any ill-health.* Opposed, however, to absence of pathogenic organisms, with respect to infections in general, are the findings of Wells and Heinbecker¹ and Wells.² These authors have shown by means of cultures and smears from throats that the respiratory flora of the Eskimo is, in general, very similar to that of persons living elsewhere. It would thus appear that infection is a function of virulence rather than of absence of pathogenic organism. Unfortunately, however, the virulence of organisms which visitors to the Arctic carry is greater than that of the organisms to which the Eskimo is ordinarily exposed, and though he can tolerate pain, extreme cold and fatigue, his resistance to infection is very poor. Whole communities have thus been wiped out by epidemics which, in milder form, occur almost invariably after the arrival of ships.

Two examples met with demonstrate different reactions to infection.

One was a case of gangrene of a frozen foot in a man at Pond Inlet, on Baffin Island. The gangrene had extended to the dorsum of the foot, and, impatient at the delay in healing, he amputated the gangrenous portion himself, and the incision was not through the gangrenous area but through the healthy tissue beyond!!

Except for some granulation, the wound was in good condition when I saw it; and the man, with the aid of a cane, assisted at the unloading of the cargo.

The other case was that of a young boy at Coral Harbour, on Southampton Island. He had injured his ankle about a week before we arrived, and had developed an extensive cellulitis which involved the whole leg, and the lymphangitis had spread to the middle of the thigh. There was marked fluctuation which was obviously due to pus in the subcutaneous tissues, but the immediate response to treatment was very good. Before the operation, at 10.30 a.m., the temperature was 103.2° and the pulse rate was 124. The skin was incised under light ether anaesthesia and approximately 8 ounces of pus were withdrawn. A gauze drain was inserted, and at 3.30 p.m., the temperature was 99.2°, and pulse 100; at 8.30 p.m. the same day the temperature was 98.6° and the pulse rate 92. The following morning, the temperature and pulse rate were normal. Clinically, the boy looked very well; and he was hungry. The dressing was changed, and the officials at the Post were given instructions with regard to dressings, etc.

The operation had to be done outside of the tent and the behaviour of the dogs was interesting. The blood and pus disappeared from the swabs as rapidly as they were discarded; and, as the child could not be moved for some hours, his brother had to stand guard. These animals, though very playful otherwise, apparently show their wolfish instinct when a man is down. The writer was told of a woman who, in 1924, was eaten alive at Chesterfield when she fell and hurt herself. Since then it has been the practice at Chesterfield to leash all of the animals except the pups.

Is the Eskimo disappearing? It is quite possible that the above-mentioned data do not properly reflect the true conditions with respect to sterility. In addition to this, there is the high infant mortality and the small families (2 to 3 children). Of degeneration in parts of Hudson's Bay and Straits there is no doubt; but there is equally no doubt that where the habits of the Eskimos are still largely native the population is not decreasing but is increasing. This statement is based upon data kindly supplied to me by police, Hudson's Bay officials, and missionaries. The following may be taken as an example. For these vital statistics (a consensus of data from the above-mentioned sources) I am indebted to Dr. A. G. MacKinnon,

* In the few epidemics of "ptomaine" poisoning, Dr. Parnell suspects that the outbreaks were due to *Trichina* (*Can. Field-Nat.*, 1934, 48: 111).

medical officer at Pangnirtung, on Baffin Island:

VITAL STATISTICS OF NATIVE POPULATION (Trading District of Pangnirtung, Baffin Island)	
Total population, July, 1931	423
Left district since July, 1931	17
Deaths in district since July, 1931	30
Total decrease	47
Births since July, 1931	71
New natives	12
Total increase	83
Excess of increase over decrease	36
Total population, 1935	459

These statistics are of interest also from the point of view of consanguineous union which must be common, though, in many cases, because of the sex life of these people, unwittingly. Since the populations amongst those who are confining themselves largely to their native life are not only not decreasing but increasing, the Eskimo affords further proof that union of near relatives is, in general, not harmful, providing undesirable recessive traits are excluded. Amongst the Eskimo many of the hereditary forms of illness must have been largely eliminated centuries ago. The Eskimos, by eliminating the misfits through the ages, have become a very healthy people, and it should be noted that though consanguineous marriage may increase the chances of appearance of recessive traits, the latter include desirable as well as undesirable attributes. My impression is that elimination is the explanation of the absence of diabetes mellitus.

Finally, a word about the desirability of keeping the Eskimo alive. For reasons which cannot be appropriately dealt with here, there appears to be no doubt that survival of these inhabitants of the Arctic will benefit the Canadian Government. There is also no doubt that the Eskimo is essential to the fur trader. It has been alleged that the white man could, with very little training, even excel the Eskimo in the art of trapping. There is, however, the time-worn analogy of the camel and his water requirements; it is possible that civilized man might excel the Eskimo — I do not know — but there is the practical problem of the willingness of civilized men to live in the Arctic throughout the year. Proof of the indispensability of the Eskimo to the fur industry is seen in the relationship which exists between the trader and the trapper. With many millions invested in the Arctic, the Hudson's Bay Com-

pany must be alert to conditions, and this Company has another reason to keep the Eskimo alive and healthy. It is, perhaps, not generally known that where there is no competition in the fur industry in the Canadian Arctic the Canadian Government has ruled that the trader must care for the indigent and helpless native. A sick trapper, therefore, means not only a smaller supply of furs but also that the trader must support the family as well as the trapper. A dead trapper means support of the family for an indefinite period, with no prospects whatever of any compensation.

I have referred to the above-mentioned responsibility for the purpose of pointing out that, with this responsibility, the Company must always be alert to the best means of keeping the Eskimo healthy, and our data clearly show that, from the many experiments of trial and error, its policy has been, and still is, a very wise one. It is its policy to encourage the Eskimo to live as much as possible in his native state; he is encouraged to live in tents, to confine his diet to the animal food of his environment and to clothe himself with the furs of these animals. Unfortunately, the unrelenting laws of evolution apply to the Eskimo as elsewhere, and, it is obvious that this practice must, with time, become more and more difficult. As the motor boat is replacing the kayak, and the gun the harpoon, so must habits of diet change. Civilized man's foods are more palatable than the native foods, and the Eskimo not only knows of their existence, but he has also tasted them. In my opinion, however, this change is not incompatible with health.

It would be very unwise from limited experience and the fragmentary data to formulate a definite plan. Some of the steps which must be taken are obvious; others will require further study. I have referred to the importance of periodic examination of the eyes, and suggested an investigation into the possibility of a less harmful method of softening leather. If the police continue their rigid policy as in the past with regard to their own men, and the Hudson's Bay Company maintain the discipline of their ships' crews, venereal disease should not be any more difficult to control in the future than it has been in the past. If I may be permitted to suggest it, more care might be taken on the part of all

concerned in the examination of officers and passengers of ships with regard to illness, and particularly upper respiratory diseases, before permission is granted these people to land on shore and intermingle with the natives. Consideration might also be given to preventive measures now available with respect to epidemic diseases—sera, vaccines, etc. With regard to the housing of the natives there is little or no problem in the case of those who hunt or trap. Their nomadic life tends to protect them against too long exposure to filth. The chief problem is with those natives who, as employees of the police, Hudson's Bay Company, and missionaries, live for the greater part of the year at the Posts. Until they can be taught the elementary principles of hygiene, and unless those concerned can maintain rigid discipline in the matter of cleanliness, as at Pangnirtung and at Craig Harbour, there is no doubt that it is in the best interest of the Eskimo to encourage him to live in his tents rather than in huts. Tent life is, at least, an open-air life. As a further precaution the natives might be encouraged to move their tents about periodically. This might seem a hardship to us but it is not so with the Eskimo. At Lake Harbour, for example, when the ship arrived on August 29th and I first approached the shore at 3.30 p.m., there were five tents only; at 7.30 p.m., four hours later, there were 32 of them. From his experiences in the Western Arctic, Dr. Urquhart also stresses the importance of shifting tents. Though he attributes the lower incidence of tuberculosis amongst the Eskimos than amongst the Indians to some extent to diet he also believes that the nomadic life of the Eskimo is a factor.

Solution of the food problem is a more difficult matter, but, in my opinion, it is not insurmountable. This is suggested from experiences at Craig Harbour, the most northerly Post in the Eastern Arctic. Here, as stated, there are two families and both men are employed by the police. For the greater part of the year these natives are housed in huts; they eat approximately the same food as the police; but they are under very rigid supervision, and one cannot speak too highly of the efforts of these officers. The huts, when I saw them, were immaculately clean. Equally important, however, is the fact that, though these natives eat

appreciable quantities of white men's food, they are still Eskimos, and, therefore, like raw meat; though they live in comfort, are well paid and, therefore, have every good reason not to hunt, they regard hunting as a privilege, and I saw a large cache of walrus. All of these Eskimos were very healthy, and one child, one month old, appeared to be exceptionally so. Contact with civilized man is thus obviously compatible with good health. The problem of food on the much larger scale, however, is a problem of metabolism, and should, in my opinion, be approached by carefully planned and properly conducted experiments on nutrition. For example, mention was made of the fact that because of his residence near the Pole and the pigmentation of the skin the Eskimo is deprived of the sun as a source of vitamin D. Since food is the chief source of this vitamin near the Pole, consideration will have to be given to this factor also in the substitution of civilized man's foods for those to which the Eskimo has been accustomed through the ages. There seems to be little doubt that should the Canadian Government decide to undertake these experiments in nutrition, it would have the full cooperation of all concerned—Hudson's Bay Company officials, the police, the missionaries, and, not the least important, the Eskimos themselves. The choice of site is important. Pond Inlet seems to me to be the best location for test-subjects. Pangnirtung, however, has the advantage of a well-equipped hospital.

The dog, indispensable in the life of the Eskimo, is, aside from the matter of hygiene, no less a problem, and there is a remarkable similarity in the variables. As the Eskimo, the half-breed dog is not a very good specimen. Experiments, such as breeding the "husky" with the St. Bernard, I was told, have been proven to be failures. As in man, there also is a relationship between food supply and health. A fifty-pound seal, though it may suffice to keep a team of twelve to fifteen dogs healthy, is not exactly a banquet, and there is also the problem of the type of food. Walrus, according to Mr. Thom, is the best food, though it tends towards laziness at times; with it there is the greatest pulling power, and the pups grow large. Fish yields a fine hair but poor pulling power. Seal is fairly good but leads to loss of weight as it has a purgative action similar to that noted in man. Caribou appears to be the worst of all;

the animals lose weight, and become irritable and unmanageable. For these reasons, the best dogs are bred on Southampton, Devon and Ellesmere Islands where walrus is abundant. Baffin Island has much seal, whereas, salmon is the chief food supply in the Ungava district. As in man, no ill effects have been observed in the dog because of the eating of putrefied meats. To keep maggots from consuming walrus, seal and whale during the warmer weather, the cached food is covered with seal oil. This, however, does not prevent putrefaction.

An experiment with respect to putrefaction is worthy of mention here. Mr. Thom again comes into the picture, and this experiment is an example of his keen sense of observation in matters biological. The purpose of this experiment was to determine the relative rates at which such foods as seal, whale, and walrus disintegrate. With no knowledge whatever of chemistry and no means of measuring rate of liquefaction by measurement of water content, Mr. Thom took, of the different types of meat, strips of approximately equal weight and equal length, suspended each strip on a separate nail, observed the rate at which the punctured portions elongated, and measured the elongations! He thus found that, of the samples tested, whale meat undergoes liquefaction the most and walrus meat the least rapidly.

The metabolism data, as stated, form the subject-matter of a separate report and contain a number of interesting observations. Of particular interest are the high non-protein values of the blood (urea, amino-acids) in the absence of renal disease and due apparently to the high protein diets. The high blood chlorides, in spite of the fact that the only source of salt is the natural salt content of the food materials, chiefly animal, the very low concentrations of sodium chloride in the urine and the high renal thresholds for sodium chloride, afford an interesting speculation in biology. Since life is incompatible without salt, it would appear that, in order to keep the concentrations of this salt in the blood constant, the renal threshold is raised. Also of interest in the metabolic data is the inability to tolerate large doses of glucose, judging from the blood sugar time curves. Of interest also, as stated, from the point of view of hæmoglobin formation is the polycythæmia and the findings with respect to the copper contents of the materials examined. From the respiration data, it would appear that the basal metabolism of the Eskimo is higher than in more temperate climates, and, from the respiratory quotients, there is good reason to believe that in the Eskimo may be found the solution to the question as to the conversion of fat to sugar. The food analyses (seal, whale, walrus, etc.), aside from their metabolic value, are of interest from the point of view of therapeutics, especially the purgative action of seal. This action applies to man as well as to the dogs. Bishop Fleming told me that constipation, though no problem in the Eskimo, is common amongst the missionaries, and he has found seal meat, which he recommends for this pur-

pose, very effective. Aside from their metabolic interest, the analyses of the sea water, the writer hopes, will prove of interest also in studies of oceanography, geology and fisheries.

ACKNOWLEDGMENTS

From the different types of examinations which we made, those familiar with laboratory work will appreciate the mass and variety of equipment which was necessary, though the work was meant to be of a preliminary nature only; and some idea of the generosity of those who assisted us may be gained from the fact that, though the equipment, if purchased, would have represented an expenditure of many thousands of dollars, and, to complete our studies, it will still require additional thousands of dollars, the actual expenditures on the part of the Canadian Government were practically negligible, having amounted to a few hundred dollars only.

Through the kind offices of Mr. J. S. Norris, of Montreal, the Montreal Light, Heat and Power Consolidated constructed a special apparatus for tests of basal metabolism suitable for work in the Arctic, and I should here like to thank Mr. E. J. Turley, Mechanical Superintendent of the Company, who was responsible for the details of its manufacture. For the x-ray examinations the Victor X-ray Corporation supplied us with a complete portable x-ray equipment with accessories by Siemens-Reiniger (Canada) Limited. The Fisher Scientific Company, of Montreal, generously donated all of the chemical equipment. To the Canadian Fairbanks-Morse Company Limited we owe thanks for scales; and, through the kind offices of Col. W. A. Grant, we had the assistance of the Associated Screen News of Montreal in our photography. One of our experiments in nutrition with the soya bean will require approximately one year for completion. This experiment is being carried out at Pangnirtung, on Baffin Island; and for the necessary supplies of the soya bean products we are indebted to the Dominion Soya Bean Industries of Montreal.

During the voyage, any one who could possibly render any assistance did so; and I should here like to acknowledge the hearty cooperation of Bishop A. Turquetil, of the Roman Catholic Hospital at Chesterfield Inlet, and that of Right Rev. A. L. Fleming, Anglican Bishop of the Arctic, for similar cooperation at the Anglican Hospital at Pangnirtung, Baffin Island. With the assistance of Dr. L. D. Livingstone at the Hospital at Chesterfield Inlet, and with that of Dr. A. G. MacKinnon at the Hospital at Pangnirtung, and the efficient nursing staffs of both hospitals, much was accomplished which could not have been otherwise.

In no small measure are we indebted to the Royal Canadian Mounted Police for their assistance at all of the Posts, and for this we have to thank Supt. Sandys-Wunsch who accompanied the *Nascopie* throughout the voyage.

Comparisons are always invidious, but too much cannot be said of the cooperation of the Hudson's Bay Company. From the little we knew of conditions in the Eastern Arctic before we undertook this study we believed that the cooperation of the Hudson's Bay Company would be indispensable, and this we found to be so. Much of the information which we hoped to obtain in our medical examinations, we knew, would depend not only upon the willingness of the natives to cooperate, but, also, upon proper interpretation of the questions we were to put to the natives and of their replies to these questions. The willingness of the natives to cooperate would depend upon their relationship with the interpreters, and I am pleased to say that this cooperation was excellent. This alone, if I may be permitted to say so, reflects the excellent relationship which exists between the trader and the trapper, and which can have no other basis than square-dealing on the part of the officials of the Hudson's Bay Company during its long period of occupancy and former ownership. As expert

interpreters, we have to thank Mr. W. E. Lyall, who, I was told, was born amongst the Eskimos and who has been with the Hudson's Bay Company practically all of his life; and also Mr. J. A. Thom, mentioned previously, another official of the Company who has had sixteen years of experience in the Arctic. We are also indebted to Mr. Alfred Copland, Hudson's Bay Company Section Manager and to all of the Post managers of the Company; and for all of this we have to thank Mr. George Watson, District Manager of the St. Lawrence and Ungava District, who accompanied the *Nascopie* throughout its voyage.

Nor does our indebtedness end here. Aside from the medical examinations, our work during the voyage was largely confined to the collection of materials for chemical and physical analysis. Such analyses require well-equipped metabolism laboratories. Material was brought back for thousands of tests, and all of these are now being made in the Metabolism Laboratories of the Montreal General Hospital. I, therefore, wish to take this opportunity of thanking the Board of Management and the Superintendent of the Montreal General Hospital, Dr. J. C. Mackenzie, for their cooperation.

Owing to shore and tide conditions, the *Nascopie* was frequently forced to anchor anywhere from one to three or more miles from shore. There was, therefore, frequently the problem of transportation to and from the shore; and if we had to depend upon the cargo boats alone, much of our work would not have been done. Here again we have to thank the Police and also the Hudson's Bay Company's post officials. Through the kind offices of Captain T. F. Smellie, we also had the cooperation of every officer and man on the *Nascopie*, and our requests were many.

Lastly, I should like to express my personal appreciation to Mr. Julian C. Smith, of Montreal, and a Governor of the Montreal General Hospital. Mr. Smith has, for a number of years, been a generous contributor to the Metabolism Department of our Hospital; it is very largely his contributions which are making possible the continuation of the Arctic work; and it was Mr. Julian C. Smith's assistance which also made it possible to have with us during the greater part of our voyage an expert chemist, Miss Florence Smith.

REFERENCES

1. WELLS AND HEINBECKER: *J. Inf. Dis.*, 1932, 50: 281.
2. WELLS: *Am. J. Hyg.*, 1933, 18: 656.

PRIMARY APLASTIC ANÆMIA*

(A CASE WITH APPARENT RECOVERY)

By E. B. ASTWOOD, B.Sc., M.D., C.M.,

Montreal

OBSCURE in its etiology, rapid in its course, and almost invariably fatal, aplastic anæmia stands alone as one of the primary anæmias unconquered by modern treatment. Recovery being most unusual, the case which is the subject of this article would seem to be of sufficient interest to warrant adequate description.

Since Ehrlich¹ first described aplastic anæmia in 1888 considerable confusion has arisen regarding the nature of the condition. Hirschfield,² in 1911, reviewed the literature to that date and more clearly defined the disease, but not until 1915, when Frank³ published his paper, was there a clear distinction between this and other severe anæmias. For many years there was no exact separation between aplastic anæmia and pernicious anæmia, the term "aplastic pernicious anæmia" being used as late as 1922.⁴ Since the development of the liver treatment for Addisonian anæmia, the differentiation of the two diseases became easy and much more important. Although primary aplastic anæmia is universally known, and is usually correctly diagnosed, the condition in reality is extremely rare. In 1908 Cabot⁵ was able to collect 24 cases, 11 of

which he discarded as unproved. Hirschfield² collected 44 cases in 1911, of which 3 had been rejected and 12 accepted by Cabot. Musser⁶ in 1914 found 3 more, estimating that 59 cases had been reported in 26 years. In 1918 Schneider⁷ could find only 60 cases in the literature of this form of anæmia, and the next year Smith discovered but 4 more. Sheard recorded 125 authentic cases in 1924, and Carey and Taylor added 20 between 1921 and 1931, setting the total at 150 cases. Greenwald in 1934 was able to find but 15 cases presenting both clinical and autopsy evidence of the disease.

The cause of the condition is unknown, but it is believed to be due to an unidentified toxin acting upon the bone marrow, impeding its activity, and causing its eventual atrophy. A secondary or symptomatic form occurs from over-exposure to x-rays or radium, the toxic effects of benzol and other coal-tar derivatives, from the excessive use of gold salts and the salts of other heavy metals, notably arsenic, and as a terminal manifestation in overwhelming septic states. To this category belong those cases of hæmolytic jaundice, pernicious anæmia, and prolonged hæmorrhage which present an aplastic marrow *post mortem*, presumably due to a final

* From the Department of Medicine, McGill University Clinic, Royal Victoria Hospital, Montreal.

exhaustion of the blood-forming organs. This secondary form cannot properly be classed as a disease entity.

Primary aplastic anæmia is a disease of the bone marrow characterized by a sudden reduction in all the myelogenous elements in the blood stream. Red cells, platelets, and granular leucocytes suffer alike and in almost equal degree, accounting for the clinical picture of severe anæmia, purpura with a tendency to hæmorrhage, and sepsis. The onset is sudden but insidious. Progressive pallor with the symptoms of anæmia usually appears first, but bleeding or purpura may be the earliest complaint. A severe infection sometimes ushers in the disease, the type of onset being determined by the blood element first affected. The blood picture is typical and seldom leads to confusion. On first examination it is usual to find the red cell count reduced to near 1,000,000, the hæmoglobin to 20 per cent, with the colour index about unity, and the white cell count between 1,000 and 2,000. The platelets are usually below 50,000; at times none are demonstrable. There is no material increase in the bilirubin of the blood or urobilin of the urine, the slight evidence of hæmolysis sometimes found being due, probably, to the decomposition of extravasated blood. The sedimentation velocity is accelerated, both because of the relative hydræmia and because of the presence of infection. There is no definite increase in red-cell fragility, although Minot holds that complete hæmolysis occurs in stronger salt solutions than normal. Unlike other severe anæmias there is little alteration in size or appearance of the cells; poikilocytosis, anisocytosis and polychromatophilia are strikingly absent. The reduction in leucocytes of myeloid origin produces a relative lymphocytosis of 80 to 90 per cent, but there is no real increase in lymphocytes. Signs of regeneration are minimal, the few nucleated red cells, reticulocytes, and immature granulocytes sometimes seen evincing regeneration are not present in numbers proportionate to the degree of anæmia. The bleeding time is not increased, but clotting is delayed and retraction of the clot is poor.

The course of the disease is a rapid one, usually ending in death within a few weeks. Anæmia becomes extreme; bleeding usually occurs from the gums, nose or gastro-intestinal tract, and petechiæ and ecchymoses cover the

skin surface; fever is almost invariably present, even when no focus of suppuration is demonstrable. Little additional is to be found on physical examination. The spleen, liver and lymph nodes are not enlarged, the long bones show no abnormality, and there are no changes in the central nervous system. That the disease invariably ends in death is not disputed by most writers. Minot places the length of life between 3 to 6 weeks; Greenwald believes that unless a case is rapidly fatal it cannot be classed as aplastic anæmia. On the other hand, typical cases are reported in people who lived for longer periods. Stewart-Harrison's patient, treated with transfusions, 105 in all, lived for four years. Lescher and Hubble in 1932 were able to cite 5 who improved materially under treatment. Gibson's patient presented a moderately severe anæmia with granulopenia. Recovery followed nine transfusions and the use of adrenalin hypodermically. However, there appears to be no case in the literature, proved by bone-marrow studies, which resulted in recovery.

Summarized, the methods of treatment adopted in the recorded cases consists for the most part of repeated transfusions, liver extract, light x-ray radiation of the long bones, splenectomy, arsenic and iron preparations, plus adrenalin. Outstanding among these is the use of frequently repeated transfusions, for by this means patients have been kept alive for long periods. There is no conclusive evidence that other forms of treatment are of any definite benefit. Adrenalin is a possible exception; its use is suggested by the fact that adrenalin causes an increase in the white cell count. The mode of this action is uncertain, and although it can be explained on the mechanical expulsion of cells from the spleen, lymph nodes, and bone marrow, there yet may be a direct stimulating effect on the production of new cells.

The pathology of the disease is confined, primarily, to the bone marrow, the changes in other organs being due to the anæmia *per se*. The bone marrow presents all degrees of hypoplasia to complete aplasia. Much controversy and confusion has arisen out of this part of the subject by reason of the limited number of cases thoroughly studied. In many reported cases no bone-marrow examination was made. A number of writers have based their diagnosis on an examination of the tibial bone marrow and in so

doing have shown their ignorance of normal anatomy. Thompson, Richter and Edsall,⁸ in an analysis of 10 cases of idiopathic aplastic anæmia and 3 of secondary aplastic anæmia, found the bone marrow to be aplastic in 1, hypoplastic in 2, normal in 3 and "very cellular" in 7. Falconer and Morris⁹ state that the marrow is fatty in the long bones and hypoplastic in the ribs and sternum. In Greenwald's case the sternal marrow was abundant in blood but deficient in hæmatopoietic tissue, with no fat replacement. Lescher and Hubble state that it is rare to find complete marrow aplasia. Minot states that some cases do not show aplasia, and elsewhere¹⁰ that there are usually areas of normal or even hyperplastic marrow. Hummel¹¹ described the marrow in his case as hyperplastic, but stated that erythrocytes and normoblasts were few. Carey and Taylor found the marrow in one of their cases to be hypoplastic. So, although the earlier writers stated that a fatty marrow was necessary to the final diagnosis of the disease, it does not appear that aplasia is as typical as the name unfortunately suggests.

CASE REPORT

A twelve-year old Canadian school boy was admitted to the Royal Victoria Hospital, Montreal, on July 4, 1934, his complaints being pallor, weakness, nosebleeding, and spots on the legs.

History of illness.—Three weeks before admission it had been noted that he was unable to compete with his classmates on the play-grounds because of weakness, ready fatigue, and shortness of breath. He was subsequently found resting during play hours, and his associates spoke of his pallor. Concern was first aroused in his mother, when, a few days later, he began to refuse food. His pallor, apathy, and continued fatigue then became apparent to her, and during the following two weeks she was astonished by the rapid accentuation of the pallor. In the course of the two weeks before admission several small nosebleeds occurred, and numerous small purple spots, which resembled bruises, appeared on the legs. The condition progressed so rapidly that on the day of admission he was unable to walk a city block without stopping to rest.

Personal history.—His early history was not unusual. When 10 months old he developed pertussis and one year later bilateral suppurative otitis media. He had uncomplicated measles at 7 years and varicella at 9. He had always been an active healthy child. Careful enquiry showed no exposure to coal-tar derivatives, heavy metals, or radio-active substances. No drugs had been taken, and there had been no recent infection of any kind. There had been no evidence in the stools or urine of the loss of any noticeable quantities of blood.

Physical examination.—This showed an extremely pale, rather poorly nourished boy, exhibiting no inclination to alter his recumbent position in bed. Temperature, 99.4° F.; pulse rate, 106; respirations, 22. The head was well shaped and covered with fine dry hair; the conjunctivæ were very pale; there was no icteroid tinge to the scleræ; the pupils were round, equal, active and the fundi oculorum were normal, except for pallor. Hearing was good and the ear-drums normal. There was no nasal discharge or obstruction. The gums were pale, with no signs of infection or bleeding; the throat was clean and the tonsils absent. There were no enlarged lymph nodes, except a few small ones in the anterior cervical and submaxillary regions.

The chest was well-shapen, symmetrical, with good expansion, and the lungs were clear and resonant. The

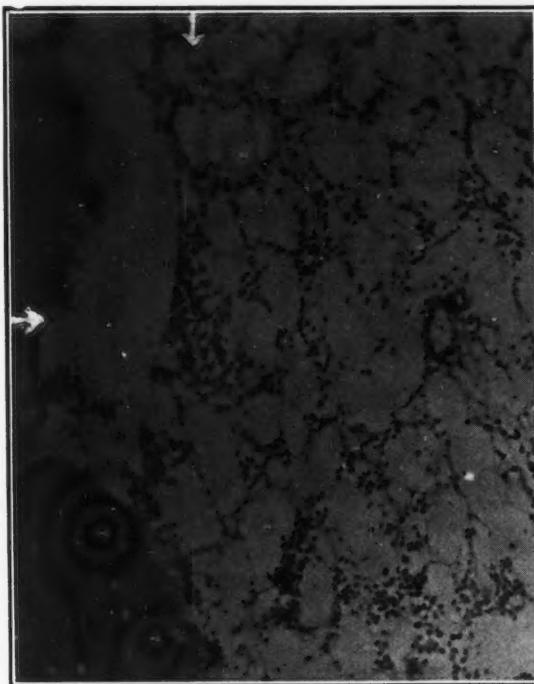


Fig. 1

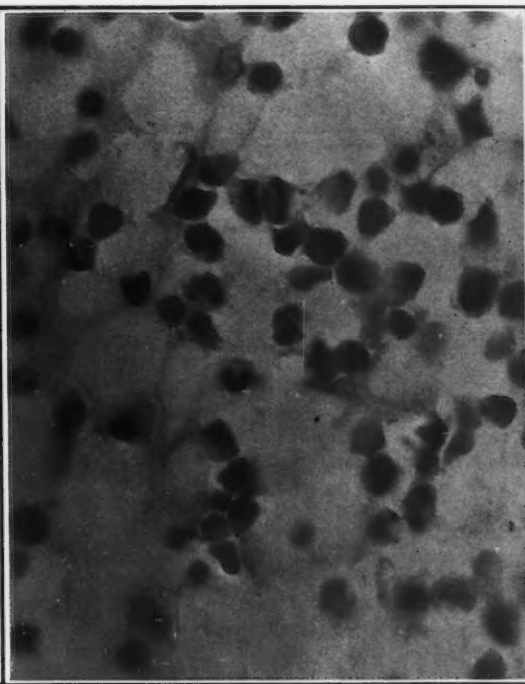


Fig. 2

Fig. 1.—Sternal bone marrow (low power), showing a scanty myeloid reticulum enclosing large fat spaces. Fig. 2.—Sternal bone marrow (high power), showing the paucity of myeloid elements.

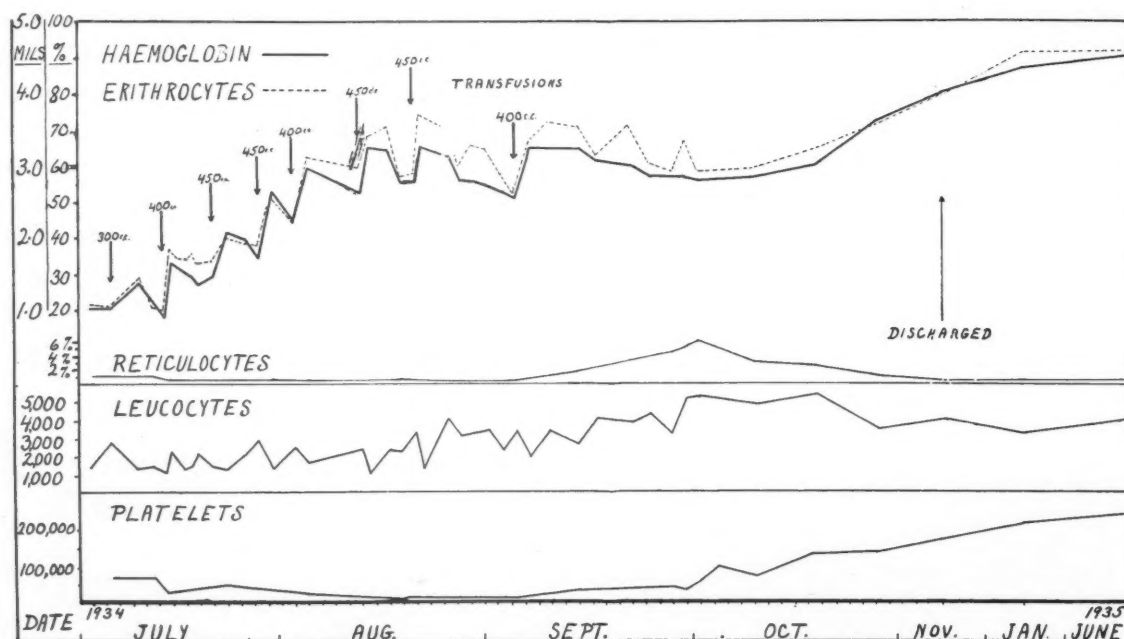
pulse was rapid, bounding, soft; the blood pressure 105/50. The heart was not enlarged. The sounds were distant but there were no murmurs.

The abdomen was soft, flat and not tender. The edge of the liver was at the costal margin; the spleen not palpable. The genito-urinary system presented no abnormality, and all the bones and joints appeared normal. The skin was of a waxy pallor, showing no icterus or lemon colour; the exposed parts were slightly darker than the body, and on the legs and thighs were many small purpuric spots from the size of a pinhead to that of a ten cent piece.

Special examinations.—Repeated urinalyses were negative; the stools on several occasions showed a trace of occult blood. Blood examinations revealed: red blood cell count, 1,100,000; white cell count, 2,900; hæmoglobin, 21 per cent; colour index, 0.95; polymorphonuclear neutrophils, 17 per cent, of which 8 per cent were stab forms; lymphocytes, 78 per cent; monocytes, 5 per cent; platelets, 80,000; the red cells were well stained; there was slight anisocytosis, but no poikilocytosis or polychromatophilia; no nucleated red cells; reticulocytes less than 2 per cent; red cell fragility slightly decreased.

siderable amount of fat and an interlacing reticular network and scattered erythropoietic and leukopoietic elements in about equal, but greatly reduced, numbers. (See Plates).

Progress.—Three days after admission the first transfusion of 300 c.c. of citrated blood was given. This caused a slight improvement, and four days later it was considered safe to remove a button of the sternum for microscopic examination. Following this minor operation the patient was exhausted and appeared to be much more ill. His red cell count was found to be 970,000, hæmoglobin 19 per cent, and white cell count 1,300. He remained in a lethargic state until the second transfusion of 350 c.c. eight days after the first. With this and the next transfusion, 20 c.c. of liver extract were given intravenously. No reticulocyte response being noted, the liver was then discontinued. Meanwhile the boy had been given 90 grains of ferric ammonium citrate daily, and although this produced no rise in reticulocytes it was continued throughout his stay in hospital. Brewer's yeast by mouth was tried but was discontinued after one month's negative response. Raw bone marrow was given by mouth for a period of two months, but



A chart showing the progress of the red blood cell count, hæmoglobin, reticulocyte, leucocyte and platelet counts, from July 4, 1934, to June 8, 1935.

The van den Bergh reaction was negative, direct, and less than 0.3 units, indirect; bleeding time $2\frac{1}{2}$ minutes; fibrin formation 8 minutes; congealing, 15 minutes; retraction of the clot, poor. Innumerable petechiæ were produced by 3 minutes' venous stasis at 70 mm. of mercury pressure; the Wassermann reaction was negative. The tuberculin reaction was negative to 1/10 mm. of old tuberculin intradermally on two occasions. Gastric analysis showed a maximum of 55 clinical units of free hydrochloric acid. X-ray showed the heart to be slightly larger than normal; the lungs and mediastinum were clear, and skiagrams of the long bones and skull showed no abnormality.

Biopsy of the sternal bone marrow.—On July 12th, a button of bone including the entire thickness of the sternum was removed with a trephine under gas-oxygen anaesthesia. Attempts were made to dislodge fragments of marrow for microscopic examination, but this was found to be impossible, as were trials at direct smears. On each occasion too little marrow was obtained to be satisfactory. Decalcification was performed and complete sections made. These showed the marrow spaces to contain a scanty myeloid tissue consisting of a con-

this gave no evidence that it was of value. One month after admission the leucocyte response to adrenalin was tested. The basal level of the white cell count being determined at 3,100, five minims of adrenalin were injected hypodermically. Within ten minutes the count had risen to 8,750 and thereafter fell slowly to the base line in 45 minutes. During the first two months there was an evening rise in temperature to 99 or 100°, with bouts of higher pyrexia, when for several days the temperature rose to 102°. During this period the appetite was poor, and the patient remained weak and inactive and seldom conversed with the other children in the ward. Whenever possible he was nursed on the sun-porch and at all times great care was taken to shield him from infection. Because of the leucocytosis produced by adrenalin, and because of the belief of some that there is a direct stimulating action on the bone marrow, ephedrin, gr. $\frac{1}{4}$, was given orally four times daily, and later increased, so that he received $1\frac{1}{2}$ gr. daily. Transfusions were continued at approximately weekly intervals until he had received eight with an average of 400 c.c. each. During this period the red cell count and hæmoglobin rose gradually, the white cell count fluctuated

markedly with an irregular rise, but the platelet count remained very low. The colour and general condition improved, but purpura persisted and the Rump-Leed test remained positive. Transfusions were then discontinued despite the persistence of purpura. Shortly after the transfusions had been stopped and the ephedrin given an increase in reticulocytes was noted, and for five weeks the count ranged from 3 to 5 per cent. During this period a slow gradual rise occurred in the red and white cell counts, hæmoglobin and platelet counts, so that on discharge on November 7, 1934, they were 3,700,000; 4,000; 80 per cent and 170,000 respectively. The differential count showed 39.5 per cent granulocytes, and the clotting time was normal. During his stay in hospital he gained 7¾ pounds in weight. Six weeks after discharge he returned for a check-up. The condition of the blood showed further improvement. The red cell count was 4,600,000; white cell count 3,400, with 46 per cent granulocytes; hæmoglobin, 87 per cent, and sedimentation velocity normal. When last seen on June 8, 1935, just one year after the onset of symptoms and 7 months after discharge, his weight was 92 pounds; he felt perfectly well, and presented the appearance of a healthy well developed boy. The blood findings were: red cell count, 4,660,000; hæmoglobin, 91 per cent; colour index, 0.97; white cell count, 4,350; polymorphonuclear neutrophils, 54 per cent of which 3 per cent were stab forms, lymphocytes, 41 per cent, and monocytes 5 per cent.

From the details given above it would appear that a complete recovery has occurred in a case which presented all the characteristics of primary aplastic anæmia. Whether or not this recovery will be permanent time only can tell. Remissions in the disease undoubtedly occur, but one of the duration shown by this patient must certainly be very unusual. To what extent the different remedies used influenced the outcome it is difficult to say, but it is certain that he would have died promptly but for the transfusions. The rise in reticulocytes and the gradual improvement which followed the use of ephedrin is suggestive that it may have exerted some beneficial action on blood regeneration. It is probable however that the recovery was spon-

taneous, and that, the absence of any heroic measures, the supportive effect of the transfusions, plus the prevention of infection by good nursing, allowed recovery to take place.

SUMMARY AND CONCLUSIONS

1. The clinical aspects of primary aplastic anæmia have been outlined and the bone-marrow findings reviewed.

2. Apparent recovery in a case, typical in its history, blood and bone marrow findings, is described.

3. The concept of complete bone-marrow aplasia as necessary to the diagnosis of aplastic anæmia is probably false.

4. As spontaneous recovery may occur in some cases, prolonged supportive treatment with repeated blood transfusions is justified.

BIBLIOGRAPHY

NOTE: A much more extensive bibliography has been prepared and may be had on application to the author.

1. EHRLICH, P.: Ueber einen Fall von Anämie mit Bemerkungen über regenerative Veränderungen des Knochenmarks, *Charité Ann.*, 1888, 13: 300.
2. HIRSCHFELD, H.: Ueber aplastische Anämie, *Folia hæmat.*, 1911, 12: 347.
3. FRANK, E.: Aleukia hæmorrhagica, aplastische (aregenerative) Anämie; Panmyelophthisis, *Berl. klin. Wchnschr.*, 1915, 52: 454.
4. GREEN, C. L.: Aplastic pernicious anæmia, *Practice of Medicine*, Tice, W. F. Prior, New York, 1922, 6: 804.
5. CABOT, R. C.: Pernicious and secondary anæmia, chlorosis and leukemia, *Modern Medicine*, Osler and McCrae, Lea & Febiger, Phila., 1915, 4: 619.
6. MUSSER, J. H.: Study of a case of aplastic anæmia, *Arch. Int. Med.*, 1914, 14: 275.
7. SCHNEIDER, J. P.: Aplastic anæmia, *Am. J. Med. Sc.*, 1918, 156: 799.
8. THOMPSON, W. P., RICHTER, M. N. AND EDSALL, K. S.: Analysis of so-called aplastic anæmia, *Am. J. Med. Sc.*, 1934, 187: 77.
9. FALCONER, E. H. AND MORRIS, L. M.: A clinical comparison of aplastic anæmia, idiopathic purpura hæmorrhagica, and aleukemic leukemia, based on studies of bone marrow, *Med. Clin. N. Am.*, 1922, 6: 353.
10. LEE, R. I. AND MINOT, G. R.: Aplastic anæmia and myelophthisic anæmia, *Nelson's Loose-leaf Living Med.*, 1921, 4: 28.
11. HUMMEL, H.: Aplastic anæmia, *Ztschr. f. Kinderh.*, 1922, 32: 285.

TREATMENT OF LOBAR PNEUMONIA.—According to W. Taylor the exhibition of oxygen, morphine, and glucose is most effective in reducing the mortality and morbidity in lobar pneumonia. Oxygen relieves the anoxæmia and cyanosis, and should be given early and continuously when indicated. In conjunction with morphine it promotes rest and relieves the heart, maintaining the strength while antibodies are being formed to combat the invading organisms. The author keeps the pneumonia patient in an oxygen tent for an overage of five days. Stimulants are not needed and may do harm. Digitalis should never be given for the toxic pneumonia heart, and whisky or brandy is not indicated except in

moderate doses in chronic alcoholic patients. Serotherapy is undoubtedly beneficial in some cases in the first four days of the illness. Glycosuria should be treated by insulin, but in many cases continued hypodermoclysis of a 2.5 per cent solution of glucose in normal saline solution is helpful, with infiltration by a 1 per cent novocain solution to relieve the pain. Glucose provides the flame for metabolic processes, maintaining a more normal metabolism and preventing acidosis. In periods of marked pulmonary engorgement and stasis intervals of dehydration may be induced by the intravenous injection of small quantities of concentrated glucose solution.—*Med. Record*, 1936, p. 63. Abs. in *Brit. M. J.*

"TULIP FINGERS": RAGWEED DERMATITIS*

By A. H. W. CAULFEILD, M.B., F.R.C.P.(C.),

Toronto

AMONGST many there seems to be considerable misconception about certain types of contact dermatitis and what, if any, relationship these cases bear to allergic dermatitis; and, as well, about the value and significance of patch tests in contrast with scratch, or intradermal, tests and the Prausnitz-Kustner reaction. It is not my intention to present a review of the literature or the dermatological aspect of this subject, but rather to report the results of the investigation of four cases and to refer briefly to case reports along similar lines.

CASE 1

M.C. was referred to me in November, 1934, by the National Department of Agriculture where he was employed. From the latter part of August, during September, and for part of October his duties necessitated the handling of tulip bulbs in large numbers. His work in this respect dated back four years. During his first year's exposure his hands were "not so very sore"; during the second, third, and fourth years they gave him a great deal of distress. The skin, he stated, at the height of the severity "would peel off like gloves", leaving a raw bleeding surface, and none of the treatments tried had had any effect. Shortly after his duties of handling bulbs started his hands would begin to itch, and this increased with the development of the severe dermatitis described. Of five of his colleagues similarly employed three had suffered in the same fashion, though to a lesser degree. The dermatitis began to subside after the "bulb season" was over, and usually by the early part of November his hands were clear. When seen early in November there was no evidence of any dermatitis. On interrogation I could find no suggestion of familial or personal allergy other than the dermatitis under investigation.

By the application of "patch tests", "scratch tests", and the Prausnitz-Kustner reaction the following results were obtained.

Patch tests.—On November 15, 1934, thin slices from different bulbs were applied for twenty-four hours. Some of the slices induced moderate areas of erythema, while others were negative.

On December 4, 1934, 30 grams of minced tulip bulbs were extracted in an ether soxhlet, evaporated, and 5 c.c. of sterile mazola oil added. Two and a half grams of the ether-extracted bulb material were extracted in 50 c.c. of glycerine and saline solvent and filtered. On January 8, 1935, patch tests were done with the oily extract, the watery solution, a thin slice of tulip bulb, with mazola oil as a control. The oily extract gave a fairly severe erythema which lasted several weeks; there was a transient erythema about the site where the watery solution had been applied. The tulip slice and the mazola oil (control) produced no reaction.

Scratch tests.—On February 12, 1935, scratch tests with the oily and the watery extracts were negative.

Twenty-four hours later, however, both showed slight reddening of the skin, whereas the control mazola oil area was negative. This was not interpreted as a delayed allergic reaction but rather as due to those factors which induce a positive patch test applied in standard fashion.

Prausnitz-Kustner reaction.—Blood was drawn for this test with the following results. A recipient (Cr.—previously proved suitable) was injected intradermally with 0.1 c.c. of this patient's undiluted serum in several sites on January 25, 1935. On January 26th the oily extract and the watery extract were applied as patch tests. When taken off thirty-six hours later there was no evidence of any reaction. At this time two remaining sensitized areas and two control areas were scratched, and the oily and watery extracts applied. Both sensitized areas gave very slight areolas and were a bit itchy; both control areas were negative. These very doubtful results of passive transfer by the scratch method were repeated on February 18th, 19th, and 20th with a different recipient (Le.). In this experiment the control sites included an area sensitized with a serum known to be positive to ragweed pollen. Scratch tests with both preparations of tulip gave identical small patches of induration and slight erythema on all serum-sensitized sites. On the 20th the ragweed serum sensitized site gave a typically positive reaction with ragweed antigen. It is felt unnecessary to try to account for those doubtful reactions which were obtained with the bulb extracts in all serum-sensitized sites. The essential result was that there was no evidence of sensitizing antibodies in the serum of an individual who was undoubtedly skin sensitive to the ether soluble fraction of tulip bulb.

Treatment.—The mazola oil extract was diluted serially up to 1:20,000 of the original solution, and an irregular series of intramuscular injections was given between July 25th and August 30th, at which time 0.4 c.c. of the undiluted extract was injected. None of the injections caused appreciable reactions or discomfort.

On October 31st the patient reported he had been entirely free from any dermatitis or distress. He added that on the preceding Saturday he had handled about 500 bulbs without gloves, and that night had felt a slight transient itching only.

There are obvious gaps in the consecutive investigation of this case, more particularly with regard to the biological activity of the solutions used for therapeutic purposes, which were due to the inability of the patient to attend as regularly or as frequently as desired.

From the report of Dr. A. P. Bertwistle¹ dermatitis is apparently a very common condition amongst those whose occupation brings them in contact with tulip bulb industry—an estimate is given that 85 per cent of those so employed are affected. In this article it is stated that "no cause is known" and "no cure is known"; the symptoms and their severity are described, and the opinion expressed that the only hope of a permanent cure is discontinuance in that type of employment. The dermatitis is apparently well known locally as "tulip fingers".

Results in Case 1 on further testing with different tulip bulb preparations.—The preparation of the first mazola oil solution left several points in doubt and new preparations were made for therapeutic purposes by varying the method. These were used for patch tests. As the original test with the ether-soluble material had given a spreading and persisting dermatitis the amount of oily extract applied to the skin was limited by the

* Read at the Section of Medicine, Academy of Medicine Toronto, March 10, 1936.

following technique. A sterile glass rod was dipped in each mazola oil solution and lightly touched to the skin; a few shreds of sterile cotton were dropped on the moist spot and covered with cellophane and lightly strapped with the minimum of adhesive, the arm being subsequently bandaged. On removal 20 hours later, two of the preparations showed extensive vesiculation and large surrounding areolas of erythema: a third preparation showed a slight erythema only. The patches were removed Saturday, January 4, 1936. Unfortunately no photographs could be taken until Monday afternoon, at which time the surrounding erythema had disappeared about the two severer reactions and that about the third positive test had faded out. The results are shown in photograph M.C. Both arms had had four patch tests.

Two points seem worthy of note. The potency of different extracts apparently may vary greatly, and after treatment, despite intensity of vesiculation, the positiveness of the reaction began to subside quickly, which is in marked contrast to the results obtained before treatment.



Fig. 1.—Case 1. (M.C.). Patch tests photographed 48 hours after removal.

From above downwards.

- Site 1. Mazola oil (control)—negative.
- Site 2. Bulb preparation D.—Intense vesiculation, with surrounding erythema, which latter rapidly faded out.
- Site 3. Bulb preparation C.—intense vesiculation, with surrounding erythema, which latter rapidly faded out.
- Site 4. Bulb preparation B.—slight erythema on removal of patch, with complete disappearance in 48 hours.

CASE 2

(P.H.A.) At the time tests were used to determine the potency of the different bulb extracts (1936), a fellow worker who experienced relatively mild dermatitis under the nails during the season submitted himself for tests. Only the two preparations giving the marked vesiculation in the previous tests on Case 1 induced areas of slight erythema. These however increased in intensity during the forty-eight hours before they were photographed. They tended to persist in the same way as did the tests on Case 1 before treatment was given; and on January 22nd the persisting dermatitis in this case now exceeded that in Case 1. Negative results were obtained with the ether-soluble fraction of ragweed pollen in mazola oil, as with mazola oil itself, the bulb material remaining after ether extraction, and the ether-soluble fraction from the hard brown outer covering of the bulb. This outer covering had been mentioned by Dr. Bertwistle amongst the three theories advanced in etiology.

Scratch tests with all bulb preparations were negative.

Prausnitz-Kustner reaction.—By means of this test there was no evidence that the serum from this case

could sensitize the skin of a suitable recipient to a subsequently applied scratch or patch test. These tests were done on January 15, 16 and 17, 1936, using the recipient (Ky.) and in a manner comparable to those conducted on these dates with Case 3.

CASE 3

G.D. was referred by Dr. L. O. C. Skeeles on August 9, 1935. The patient was at that date in an early stage of marked desquamation of the exposed surfaces—face, neck and hands. He stated that this attack had begun during the third week in July when he was on a week-end visit in the country, and was due, he thought, to weeds in the immediate neighbourhood or to “something in the water”. At any rate the initial rash began the second day he was there and to him seemed to follow the washing of his hands and face in water collected in a rain barrel. Further interrogation brought out the following statements. Similar attacks had occurred for each of the last ten years, though usually a little later—

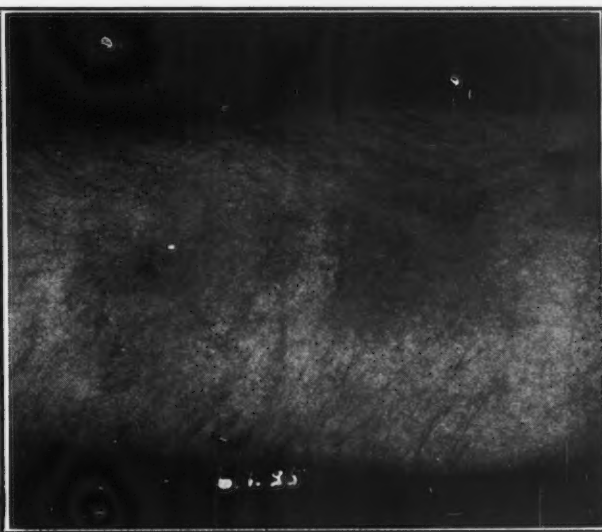


Fig. 2.—Case 2. (P.H.A.). Patch tests photographed 48 hours after removal.

From above downwards.

- Site 1. Ragweed preparation (control)—negative.
- Site 2. Bulb preparation C.—positive, which increased in intensity for many days after removal.
- Site 3. Bulb preparation D.—positive, which increased in intensity for many days after removal.
- Site 4. Bulb preparation E.—negative.

“before or during the first week in August”. He was employed in a wholesale fruit and vegetable exchange, which fact did not seem to lessen the number of probable excitants. In this case also there was no suggestion of familial or personal allergy, other than the dermatitis under investigation.

Patch tests.—Weeds were collected in the immediate environment where he had been staying, extracted and Seitz-filtered. Both the filtrate and a piece of filter pad were used for patch testing. Two quarts of the water he had used for washing were evaporated to a few c.c. and filtered. Both filtrate and filter pad were used for patch testing. As a fifth test material the moist residue resulting from evaporation of the ether-soluble portion of practically all wind-borne pollens about Toronto was used. All six substances were applied on August 27th as patch tests and removed twenty-four hours later. The ether-soluble fraction of the combined pollens was positive with vesiculation. The mixed weed extract showed a slight areola and the other four were negative. Later observation showed a persisting and weeping reaction about the mixed pollen material which lasted for about 10 days. On November 22nd the ether-soluble fraction

of ragweed, of mixed grasses (the maximum pollen producers at the time of his attack), and of all pollens (as previously used) were applied. Twenty-four hours later the ragweed pollen area and the mixed pollen area were positive with vesiculation, and the mixed grasses, negative. Seen on the 25th, the ragweed area showed marked vesiculation much greater than with the mixed pollens.

Accepting for the moment the etiological validity of these patch tests for ragweed, it is interesting to note that at the time of his attack this weed was in its early growth. A few pollen grains may appear in the air about August 15th, but the maximum air counts occur towards the end of August and continue up to about the middle of September. During this period (August-September) he had already recovered from his dermatitis, and had noticed no symptoms suggesting hay-fever or asthma. This was true not only for this year but for all the ten years he had so suffered with his severe seasonal dermatitis.

Further tests with this case gave the following results.

Patch tests.—On January 6, 1936, the following solutions were used: (1) mazola oil; (2) mazola oil solution of the ether-soluble fraction of ragweed pollen (0.93 grams of the moist extract in 10 c.c. sterile mazola oil); (3) a 2.5 per cent watery extract of ragweed pollen previously defatted by ether; and, (4) mazola oil solution of tulip bulbs used in Cases 1 and 2 (the most potent, biologically, being chosen). After removal twenty-four hours later numbers 2 and 3 showed an intense vesicular reaction, number 2 being recorded as 4 plus and number 3 as 2 plus. Numbers 1 and 4 were negative. A possible explanation of the result obtained with the watery solution is that the ether extraction had not been complete.

Scratch tests.—Before applying the patch tests scratch tests were done with the following substances, two dried protein-containing fractions of ragweed, purified ragweed carbohydrate material, and unaltered ragweed pollen. All were negative.

Prausnitz-Kustner reaction.—On January 15, 1936, four sites were injected on the back of a proved suitable recipient (Ky.) with 0.1 c.c. serum. On January 16th, two of these treated sites were scratched and the mazola oil solution of ragweed (No. 2 of the previous patch test) and the watery solution of ragweed (No. 3 of the previous test) were applied. No reaction resulted. On this date these two solutions were applied as patch tests to the two remaining serum-treated sites. On removal twenty-four hours later there was no visible reaction. Including control areas, fourteen sites on the back of recipient (Ky.) were used, for Cases 2 and 3.

With this case of apparent ragweed dermatitis patch tests showed vesicular reactions to the moist ether-soluble fraction of ragweed pollen, to the mazola oil extract of this fraction, and to a lesser degree to the watery extract of ether-defatted ragweed pollen. In all three patch tests the degree of reaction continued after the removal of the patch tests. The photographs taken on January 9th (4 days after removal) were not satisfactory and are not shown. With scratch tests no immediate "allergic" reaction was obtained. No evidence was obtained that this patient's serum was capable of sensitizing a suitable recipient's skin to either scratch or to patch tests applied to these areas.

These findings correspond to the results reported by Brown² *et al.*, Pascher and Sulzberger,³ and others, with the exception of the case of ragweed dermatitis reported by Gay and Ketron.⁴ In this particular case all three types

of tests were positive, namely, patch, scratch, and the Prausnitz-Kustner reaction. This variation illustrates, I think, the value of recording the results of all three types of skin testing in such cases.

As noted by Stroud,⁵ the presence of one group of allergic dermatitis does not deny the existence of another in the same individual". I would comment on this to state that there is no reason why a truly allergic individual may not contract as well a contact dermatitis from the same or other excitants to which he is allergically sensitive. Based upon the findings obtained in hay-fever and to a less evident degree in asthma, two basic features of the allergic or atopic individual are (1) that an immediate skin reaction results on scratch or intradermal testing, and (2) that the serum of the individual so reacting gives a positive Prausnitz-Kustner reaction. It is probably too early as yet to decide whether or not the demonstration of the presence or absence of these two phenomena should be regarded as the criteria upon which to base a diagnosis of the allergic state in human beings.

CASE 4

This case affords an excellent contrast to the preceding one, and is, so far as I know, the only instance reported of urticaria due to the inhalation of pollen, chiefly ragweed pollen.

B.A.E. was referred to me by Dr. McDonald, of Oshawa, on October 29, 1935. In brief she gave a history of the seasonal appearance of "hives" for the last ten years. The attacks usually came on in July, and became increasingly severe in a periodical manner throughout August, September, and part of October. This year she said they were more severe and frightening, and were located chiefly, but not entirely, in the throat. There was as well a history of some nasal distress and a sense of compression on the chest, which suggested after the skin testing was completed a mild hay fever or even a pollen asthma. Positive hereditary history was afforded in that one sister suffered from asthma and her mother had some type of respiratory distress, but was supposed to have died of a heart attack.

Routine scratch and intradermal tests with the inhalants were negative, with exception of cat hair against which a small one plus reaction was obtained. With the important and common foods which included all of a seasonal character corresponding to the July-October period all tests were negative, except for a doubtful reaction against egg, milk, and cheese. Intradermal tests with these were negative. With the summer pollens small positive wheal reactions were obtained against June, Orchard, and Timothy pollen. With the autumn pollens large wheal and areolar reactions (measuring 10 by 12 mm.) were obtained against two of the Ragweed fractions.

The *Prausnitz-Kustner reaction* with the watery extract of ragweed pollen was positive.

Patch tests with the ether-soluble portion of timothy and ragweed pollen were negative, as were also patch tests with all fractions of ragweed pollen.

This case illustrates an urticaria-like eruption which would seem to be caused by certain of the summer and autumn pollens. The seasonal character of the eruption corresponded to the air content of the pollens giving positive tests. In the important aspects the findings are directly reversed from those obtained in Case 3. The differences between this last case and the first three are emphasized in the Table, in which the essentials between contact dermatitis (Cases 1-3) and allergic or atopic dermatitis (Case 4) are given in graphic form.

we would not seem to be in a position to compare the relative frequency of ingestion and inhalation as the cause of a specific dermatitis. In both instances the resulting dermatitis is regarded as allergic in character.

Figley and Parkhurst⁶ report 5 instances of atopic dermatitis in which skin sensitivity to silk was the major reaction obtained. In all five cases serum sensitizing antibodies (or reagins) were demonstrated; and in all five cases patch tests were negative. In both groups, namely, those cases of dermatitis due either to ingestion

TABLE
FUNDAMENTAL DISTINCTIONS BETWEEN CONTACT DERMATITIS (AS REPORTED)
AND ALLERGIC DERMATITIS

	<i>Contact Dermatitis</i>	<i>Allergic Dermatitis</i>
1. EXCITANT	Ether soluble fraction (non-antigenic)	Water soluble fraction (antigenic)
2. MODUS OPERANDI	By contact	By ingestion or inhalation
3. HEREDITY	Unimportant	IMPORTANT
4. DIFFERENTIAL TESTS		
(A) Patch	Positive	Negative
(B) Scratch or Intradermal Immediate reaction	Negative	Positive
(C) Sensitizing Antibody (P.K. Reaction)	Negative	Positive

Preventive seasonal treatment will be tried this year with Cases 3 and 4. In Case 3 this will consist of the intramuscular injection of the ether-soluble fraction of ragweed. In Case 4 the usual solutions of grass pollen and ragweed pollen will be given as in a case of seasonal hay fever.

DISCUSSION

Skin eruptions following the ingestion of different foods are sufficiently common that they are appreciated by the laity as well as the profession. This frequency, and the clinical results which follow the exclusion of the particular food, are undoubtedly the explanation for the fact that such occurrences are not further investigated by the different methods now available. That definite affections of the skin may follow the inhalation of substances normally in the air is not, I believe, as well appreciated by the profession in general. The proof that the dermatitis is the result of inhalation of specific substances is not easily determined without special methods of investigation. Consequently

or inhalation, they were regarded as or proved to be allergic in character.

Coca,⁷ discussing diagnosis and treatment of allergic diseases of the skin suggests three subdivisions, in one of which the first three cases reported would be in the group of contact dermatitis. In a second subdivision would be included those cases due to inhalation and ingestion, assumed or proved to be allergic in character.

Methods of classification are of course but a means of grouping divergent findings in entities otherwise apparently similar. In view of the fundamental variations which can be shown between such cases as the first three reported and true atopic dermatitis (such as the fourth case) the question arises as to the advisability or expediency of including such cases of contact dermatitis under the heading of allergic conditions. At the most they would seem to prove only that the skin of the individual so affected has a specific skin idiosyncrasy. Just why or through what specific means such patients (as Case 1) are brought back to a relatively normal state by the intramuscular injection of sub-

stances not regarded as antigenic (in the terminology of the immunologists) remains to be proved.

One further comment about the three specific tests employed with these cases, more particularly the Prausnitz-Kustner reaction, may be offered.

The literature is replete with reference to the proper interpretation of the immediate and delayed reactions to scratch or intradermal skin tests: to a less extent, to the proper interpretation of patch testing; criticisms with which I am not so familiar. While no such criticisms have been made about the Prausnitz-Kustner reaction the literature fails to record its exquisite specificity. It has been shown elsewhere⁸ that this test is sufficiently specific to enable one to discriminate between the closely allied, though biologically different, antigens contained in a single pollen solution such as ragweed; and to show linkage between the different antigens within such a pollen extract and the corresponding antibodies in a person suffering from ragweed hay-fever. Also recent studies as yet unreported have shown that the serum of a selected patient suffering from ragweed hay-fever, diluted to 1 in 10,000, will give a positive Prausnitz-Kustner reaction.

The first three case reports have been presented as representative of identical types of contact dermatitis due to two similar fractions obtained from different types of vegetation. The specific dermatitis which is the result of ingestion or inhalation of substances to which the particular individual is sensitive varies in many fundamental aspects from such contact cases and is illustrated by case four. In many instances (due to inhalation or ingestion) there is the assumption rather than the proof that the *modus operandi* corresponds to what takes place, for instance, in hay-fever or, in other words, is "allergic". In the Table I have attempted to show these divergent aspects in graphic form.

SUMMARY

1. The results of the investigation of a case of "tulip fingers" have shown the ether-soluble portion of the tulip bulb to be the cause of the dermatitis. The intramuscular injection of this fraction taken up in mazola oil prevented the outbreak of a severe dermatitis for the first time in a seasonal exposure of five years' duration.

This ether-soluble fraction in oil gave a less pronounced patch test with another individual who experienced mild symptoms on his seasonal exposure to tulip bulbs.

2. A case of ragweed dermatitis is added to the list of those already reported. In concurrence with the majority, the exciting factor was found to reside in the ether-soluble portion. It was interesting to record that in the ten years' duration of seasonal dermatitis the attacks occurred during the early growth of the weed and before the pollen content of the air had appeared in any considerable quantities; and that during the height of the pollen air content the dermatitis had subsided without the advent of any symptoms of an allergic character.

3. A case of urticaria-like skin and mucous membrane eruption, of a strictly seasonal character, was found to give positive scratch tests to different pollens, but more particularly to ragweed pollen which corresponded to the seasonal air content of the pollens giving positive tests. A positive Prausnitz-Kustner reaction was obtained with a solution of ragweed pollen, whereas patch tests with all fractions of ragweed pollen were negative.

4. Some comment has been made on the diagnostic value and the therapeutic significance afforded by the use of three tests—the scratch (or intradermal) test, the Prausnitz-Kustner reaction, and the patch test—in the investigation of dermatitis suspected of being either of allergic or contact etiology. A Table based upon these three tests attempts to give in graphic fashion the fundamental differences between cases of contact dermatitis (corresponding to the first three reported) and the prevalent conception of allergic or atopic dermatitis (corresponding to the fourth case).

REFERENCES

1. BERTWISTLE, A. P.: Tulip fingers, *Brit. M. J.*, 1935, 2: 285.
2. BROWN, A., MILFORD, E. L. AND COCA, A. F.: Studies in contact dermatitis; nature and etiology of pollen dermatitis, *J. Allergy*, 1931, 2: 301.
3. PASCHER, F. AND SULZBERGER, M. B.: Ragweed dermatitis; report of 2 cases, *Arch. Dermat. & Syph.*, 1933, 28: 223.
4. GAY, L. N. AND KETRON, L. W.: Case of ragweed dermatitis recurring over a period of 13 years, *J. Allergy*, 1932, 3: 479.
5. STROUD, C. M.: Allergic dermatitis, *South. Med. J.*, 1935, 28: 665.
6. FIGLEY, K. D. AND PARKHURST, H. J.: Silk sensitivity, *J. Allergy*, 1933, 5: 61.
7. COCA, A. F.: Specific diagnosis and treatment of allergic diseases of the skin, *J. Am. M. Ass.*, 1934, 103: 1275.
8. CAULFIELD, A. H. W., BROWN, M. H. AND WATERS, E. T.: Experiments to determine whether the allergically active substance in ragweed pollen extract is a single entity or multiple, *J. Allergy*, 1935, 7: 1.

SOLITARY MYELOMA OF THE ILIUM

BY CHARLES LIEBMAN, *Radiologist*, AND SOL. E. GOLDMAN, *Associate Surgeon*,*Department of Orthopaedics, Jewish General Hospital,**Montreal*

THE original conception that multiple myeloma was a true neoplasm changed to the later belief that it is a systemic disease of the hæmatopoietic system. However, the assumption that myeloma is always multiple has been contradicted by the reports of single lesions. In a recent editorial in the *Journal of the American Medical Association*¹ attention was called to the occurrence of these single lesions, which, when favourably situated, offer possibilities of complete surgical removal and a better prognosis than in the past, when all myelomas were thought to be multiple and fatal in about two years. The number of cases of solitary myeloma reported is relatively small, and all of them, with one or two exceptions, have occurred in the shafts of the long bones.

In a review of all these, the microscopic appearance is consistently the same, namely, that of a cellular plasma-cell tumour with very little stroma. The gross appearance in general is also the same—a large, vascular, mushy tumour, expansile in character, thinning the cortex of the bone in some instances to paper-like consistency. Pathological fractures occurred in most of the cases reported, and usually were the first indication of the presence of the tumour. In some cases the radiological appearance was that of a single cavity in the medullary portion of the bone, expanding and thinning the cortex; in others, there was a multilocular character resembling that seen in giant-cell tumour. With one exception, in all of these reported cases none of the classical signs of multiple myeloma were present, namely: (1) multiple skeletal tumours in an adult over thirty-five; (2) pathological rib fracture; (3) Bence-Jones' bodies in the urine; (4) lumbar backache with signs of early paraplegia; (5) unexplained anæmia; (6) a chronic nephritis with nitrogen retention and low blood pressure.

Mathias² reported a case of solitary myeloma of the skull which was cured by surgical removal of the tumour. No recurrences or metastases could be observed in x-ray studies eighteen

months later. There was no anæmia and no Bence-Jones' bodies. Rutishauser³ described a case, which was also reported by Charbonnier and Mermod,⁷ of an elderly woman who sustained a pathological fracture of the left femur and who had suffered from "rheumatic" pains in the left hip joint from some time previously. The original x-ray film showed destruction of the shaft of the femur, suggesting a malignant growth. The pathological diagnosis of the section obtained by biopsy was multiple myeloma. No Bence-Jones' bodies were present in the urine and no other tumours were found in the skeleton. The patient eventually died from progressive cachexia. The anatomical diagnosis was solitary myeloma (myelosarcoma) of the shaft of the femur, and several parts of the section presented the appearance of a plasmacytoma. Rutishauser states that the lesion in this case was essentially myeloma, which formed the tumour, and that most of the cells were of the plasma-cell type. However, there was considerable variation. He further commented on the few examples of such cases reported in the literature. Walthard⁴ reported a case which, on post-mortem study, proved to be a circumscribed plasmacytoma of the third thoracic vertebra. In a personal communication, Dr. H. F. Friedman, of Boston, stated that he had seen two cases of solitary myeloma involving a single vertebra. Geschickter⁵ reported a case involving the upper end of the shaft of the femur, and makes mention of a second case involving the clavicle. He points out that these tumours are distinctly medullary in location and bone-destructive in character. He also stated that x-ray therapy had no effect on the course of the tumour involving the femur. Rogers⁶ described a case of solitary plasma-cell myeloma involving the shaft of the femur with a pathological fracture. This case was treated with radium without effect, and eventually amputation of the leg was performed, with apparent cure.

It was therefore felt that it might be interesting to report a case of solitary myeloma in the

ilium, no others having been found in the literature, and, incidentally, to emphasize the difficulty of radiological diagnosis.

CASE 1

The patient was a male, aged 50, first admitted to the orthopaedic service of the Jewish General Hospital on December 31, 1934. His complaints were pain and coldness of the right lower extremity associated with a limp. He stated he had suffered intermittently for the previous five years from coldness in the right leg, from the knee to the ankle. For the previous six months he had been troubled with sharp, severe pains in the lower lumbar region, which had been increasing in severity and were accompanied by a right-sided limp. Of late, the pain and the limp had become so marked that he had experienced great difficulty in walking. He had attended various outdoor clinics and had been treated for rheumatism and sciatica without relief.

His past history was unimportant.

With the exception of the skeletal system, general physical examination was negative. There was marked tenderness on deep pressure over the right iliac bone and the right sacro-iliac area. Some atrophy of the

gluteal muscles, thigh and calf, also on the right side, was observed. The spine was held somewhat rigidly, and all movements were restricted. There was a marked right-sided limp, with listing of the trunk to the right and inability to bear any weight on the right leg. No swelling or masses could be observed on inspection or palpated manually.

Laboratory findings were essentially negative. There were no marked anaemia, no interference of renal function, and no Bence-Jones' bodies. Faeces, negative.

X-ray findings.—The x-ray examination of the pelvis revealed a large, cystic and trabeculated area involving the lower half of the right ilium and apparently breaking through the cortex at a point about two cm. above the superior lip of the acetabulum. Within this cystic area were numerous multilocular areas quite similar to the appearance of a giant-cell tumour (Fig. 1). On many repeated examinations, extending over a period of nine months, the character of this tumour had not changed appreciably. No metastases or other bone involvement throughout the entire skeleton could be found. The appearance suggested giant-cell tumour, with the possibility of myeloma. (The possibility of it being an endothelioma was later considered, after viewing another case.)

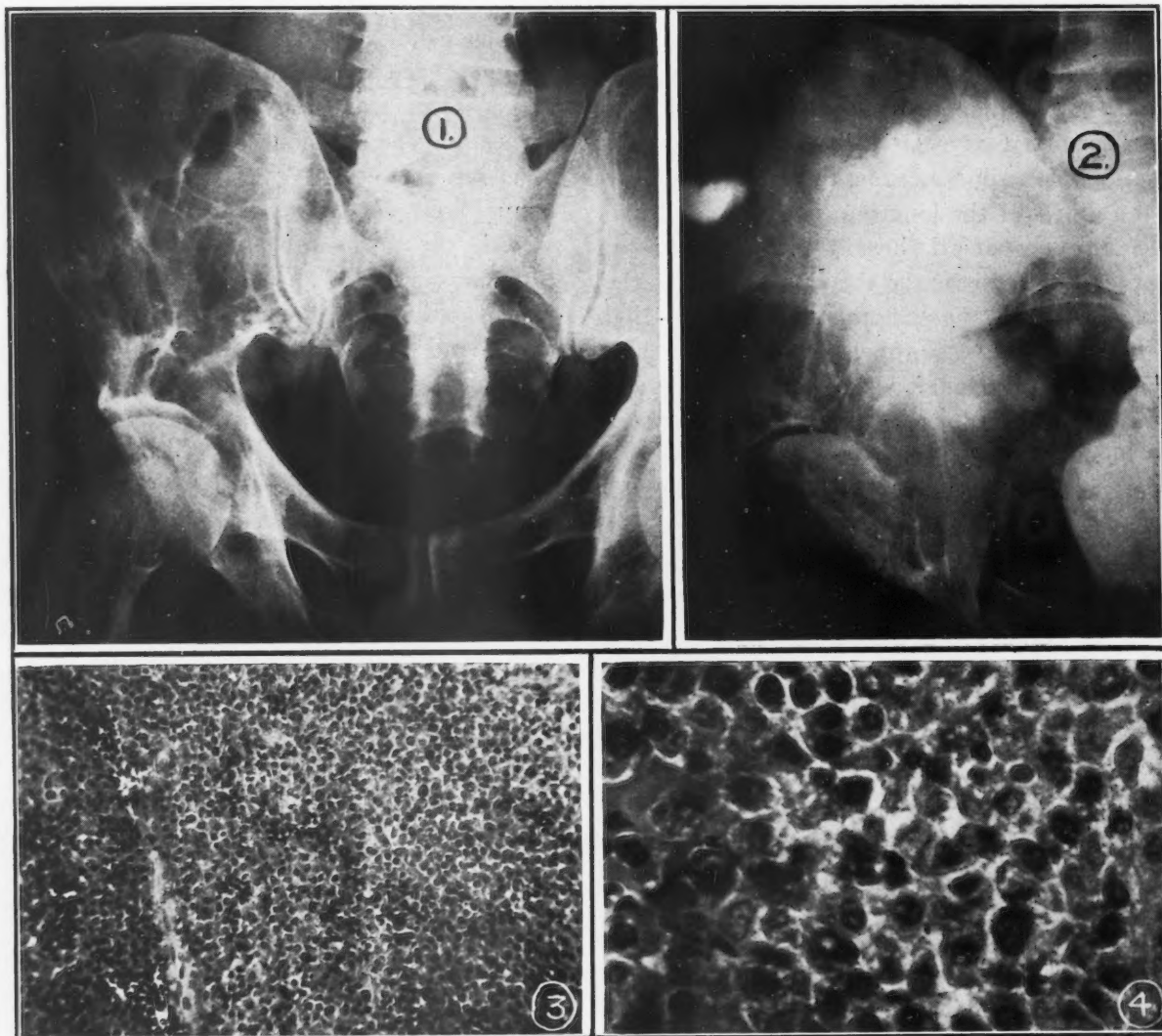


Fig. 1.—Large, cystic tumour invading the right ilium. Cystic and trabeculated areas. Growth has broken through the bony cortex medially at level of the superior lip of the acetabulum.—Solitary myeloma. **Fig. 2.**—Expansile and trabeculated tumour with cystic areas and breaking through into the acetabulum. Not quite as extensive as in Fig. 1, but with same radiographic appearance.—Endothelioma. **Fig. 3.**—Low-power field of biopsy specimen. **Fig. 4.**—High-power field of biopsy specimen.

On February 23, 1935, a biopsy of the tumour was performed by means of a Smith-Peterson anterior approach. At operation, it was found that the outer cortex of the ilium was intact and normal in appearance, except in one area in the centre; here a small perforation about the size of a ten-cent piece was observed, and through this perforation a thick gelatinous, greyish tissue presented. A probe was passed through the perforation into the tumour mass, which felt soft and spongy and oozed blood freely. Since the tumour presented anteriorly into the pelvis it was impossible to ascertain its actual extent, but enough tissue was removed for pathological section and the wound closed in the usual manner. The patient made an uninterrupted recovery, and was allowed up on crutches about two weeks after the operation.

Because of the type of tumour encountered, its extent and unusual location, any further operative procedure was not deemed advisable, and deep therapy was instituted. Up to the present time, there have been no marked changes in the affected bone as a result, but, clinically, at the present time the patient is well and able to get about with the aid of crutches.

Report of the pathologist (Dr. D. P. Seecef).—"Several bodies of tissue made up of compact, round and polygonal cells with a moderate amount of cytoplasm and large, round, heavily stained nuclei. There is a thin, scant vascular stroma. Here and there are foci of free hæmorrhage, œdema and an occasional spicule of bone. Diagnosis.—Myeloma." (Figs. 3 and 4.)

While the deep x-ray therapy did not seem to have had any appreciable effect radiologically, there have not been any metastases and the tumour itself apparently has remained about the same size. The patient feels well, has considerably less pain and limp, and has not lost any weight.

As previously indicated, one of the reasons for presenting this case was the unusual appearance shown on the x-ray film, which made it difficult to establish the diagnosis by x-ray examination alone. To further emphasize this latter point, another case is mentioned here through the courtesy of Dr. L. Ritchie and Dr. N. T. Williamson, of the Montreal General Hospital, where the radiological appearance apparently duplicated that seen in the case which is reported above. As can be seen from the illustration, both the location and extent of this second tumour, plus its general appearance on the film, would lead one to believe that both were of the same structure. The diagnosis made by biopsy in this latter case was Ewing's tumour. In this case there was evidence of other bone involvement.

CASE 2

The patient was a middle-aged male who complained of a sore hip, of fifteen months' duration. The pain was sciatic in type, radiating down the right leg, gradually increasing in intensity over a period of one year. Various treatments had been tried without relief, and the true nature of the condition was only revealed by the x-ray, which showed a definite lesion in the pelvic bone (see Fig. 2). The past history, physical examination, and laboratory findings were all negative, but no mention was made as to the presence or absence of Bence-Jones' bodies. The roentgenogram findings, as reported on by Dr. Ritchie, were as follows:—

"Evidence of a large, destructive area involving the ilium and breaking through the acetabulum into the joint, and also breaking through just below the anterior superior spine. This has the appearance of being a malignant bone growth, and the unusual appearance of the absorption makes one suspect that this is probably a hæmangio-endothelioma."

Sections of the tumour obtained by biopsy showed it to be a diffuse endothelioma of the ilium, a Ewing's tumour. Skiagrams taken after a course of deep therapy showed considerable regeneration of bone in the tumour area. The patient eventually died of multiple metastases in the sacrum, left ilium, vertebrae and ribs.

COMMENT

While Geschickter states that the x-ray diagnosis of giant-cell tumours should not be difficult, yet the radiographic appearance of the tumours here recorded appears to be very similar to giant-cell structure, because they had all the characteristic appearances and the more likely location for a giant-cell tumour. That the authors' case might be a myeloma was suggested as a rather remote possibility, and the pathological findings confirmed this suggestion. The second case, used for comparison, also points to the fact that Ewing's tumour can occur in persons over thirty-five.

SUMMARY

1. A case of solitary myeloma of the ileum is presented.
2. Another tumour of the ilium is presented, which, although almost identical in its radiographic appearance, was of entirely different histological structure.
3. Diagnosis by x-ray alone in the case of bone tumours is uncertain, and tends to confirm the opinions that all other diagnostic measures, particularly biopsy, where feasible, should be employed.
4. Other bone tumours may give the radiological appearance which is commonly considered characteristic of giant-cell tumour and yet be of entirely different histological structure from the latter.

Since reporting on this case, a similar case of solitary myeloma of the ilium was reported by Pohle and Stovall, *Journal of Radiology*, November, 1935.

REFERENCES

1. The problem of myeloma, Editorial, *J. Am. M. Ass.*, 1935, 104: 1420.
2. MATHIAS, E.: Zur Myeloma Frage, *Beitr. z. klin. Chir.*, 1935, 161: 1.
3. RUTISHAUSER, E.: Zur Frage der solitären Myelome, *Centralbl. f. allg. Path. u. path. Anat.*, 1933, 58: 355.
4. WALTHARD, B.: Zircumscribtes myelogenes Plasmocytom der Wirbelsäule, *Schweiz. Wehnschr.*, 1924, 54: 285.
5. GESCHICKTER, C. F.: Multiple myeloma as a single lesion, *Ann. Surg.*, 1930, 92: 425.
6. ROGERS, H.: A case of solitary plasma-celled myeloma, *Brit. J. Surg.*, 1930, 17: 518.
7. CHARBONNIER, A. AND MERMOD, A.: Un cas de myélome solitaire du fémur, *Rev. Méd. de la Suisse Romande*, 1934, 7: 699.

SCHIZOID TRENDS IN CHILDREN*

BY C. A. CLELAND, M.D.,

*Director, Mental Health Clinic,**Brockville*

BECAUSE of the high incidence of mental illnesses of the schizoid type in our mental hospitals it seems to be of great importance to those of us engaged in their treatment to trace those illnesses back to their beginnings, in order to give us direction in our attempts to modify mentally unhealthy behaviour. In this paper I wish to review briefly some of the recent literature regarding schizoid trends, as well as to present a few interesting cases from the records of the Mental Health Clinic at Brockville. We must start with the belief that behaviour disorders in children are but symptoms of deeper stresses and difficulties.

Kraepelin¹ considered that dementia præcox or schizophrenia was probably the most frequent psychotic state found in childhood, and of his cases of schizophrenia he found that 3.5 per cent developed before the age of 10 years. His opinion was that it was very often very difficult to determine the point of time at which the illness began, because of its insidious onset. Ksanin² found that 19 out of his group of 151 cases of schizophrenia had an insidious onset, probably beginning in childhood, and suggested that these cases might be grouped as "constitutional schizophrenics". In each of the 19 cases it appeared that the individual concerned was, in childhood, considered by his associates to be "different", "queer", or "odd". He (or she) would have few or no friends, would not mix well, but, as a general rule, would never get into any trouble. The personal oddity would increase with age and the patient would insidiously drift into a psychosis, which was to a large extent an exaggeration of the peculiar type of personality that had existed since childhood.

General opinion seems to have changed somewhat during the past twenty-five years concerning the personality characteristics present before the onset of a schizophrenic illness. Hoch³ in 1910 stated that 57 per cent of his group of 110 cases of schizophrenia had shown previous

to their illness a definitely clean-cut "shut-in personality", and only 18 per cent showed normal personalities. Bond and Abbott⁴ in 1912 showed in their group that 68 per cent of dementia præcox patients possessed normal personalities previous to their illness, but they found that 20 per cent of the cases showed definite seclusiveness. Blalock⁵ in 1932 stated that 15 out of a series of 25 catatonics had shown approximately an even amount of introversion and extroversion before their illness. Page, Landis and Katz⁶ in 1934 came to the conclusion that personality traits which have been thought of as schizophrenic occur as often in the normal group. Further, in their tests they found that such traits as (a) feelings of inferiority; (b) daydreaming; (c) difficulty in making decisions, are more common in the normal than in the schizophrenic group. They conclude that single traits are not important, and that only the reactions of the total personality are of any value in forecasting the future of any individual.

In children, the symptoms of potential or actual schizophrenia are limited as compared with adult symptoms. This is because the intellectual development and life experiences are less advanced. Potter⁷ states that the commonest symptoms he has found in child psychotics of the schizophrenic group are (a) retraction of interest from the environment; (b) defect in emotional rapport; (c) distortion of effect; (d) blocking of thought-symbolization, mutism, etc. He further shows that there is a superficial resemblance between schizophrenic children and defectives of the unstable type, but that the real difference is that the schizophrenic child has difficulty in making his intellectual processes objective.

The schizoid manner of reacting to reality is, in our opinion, not so much a *flight* from reality as an *attempt to ignore* reality. Negativism, a very common schizoid symptom, aims at shutting out all external stimuli. Day-dreaming, which is a not uncommon finding in children, should

* A paper read before the Ontario Neuro-Psychiatric Association.

only be considered dangerous when it is used to compensate for lack of success against reality. When it becomes a habit it makes the child feel very helpless and inadequate towards the situations he meets in actual life. But, a well developed schizoid cannot afford to day-dream—the complexes which he is fighting are connected at too many points with his normal existence, and to day-dream would bring in a flood of those ideas which he is trying to forget. The over-introverted child tries to forget the unpleasant things; if he progresses toward psychosis he will succeed in forgetting all the undesirable things that have ever happened to him. He gets into a condition where he cannot react to the present in a normal manner, for this would add to the store of realities that would subsequently have to be forgotten, so he becomes shut-in, contrary, and negativistic.

The following case, a well defined schizophrenia of the catatonic type, in a girl of 14, has many interesting angles.

CASE 1

K.P., female, aged 14, of Polish extraction, was admitted to mental hospital with auditory and visual hallucinations, blocking of thought, marked negativism, *flexibilitas cerea*, etc., and shortly afterwards went into a stupor which lasted nearly two months. After this an excited period was initiated by a sudden laughing spell when she was being fed by the nasal tube, on which she remarked to the physician doing the feeding that the tube-feeding process was a "holy wedding".

The father and mother are illiterate people. The father, an improvident labourer, deserted when the patient was seven years old. The mother's family are all unstable, and many of them have been in serious conflict with the law. The mother has been mentally ailing for some years, hears strange voices disparaging her occasionally, complains to neighbours that people pound the walls of her house, tap on her window panes; also, on the street, she believes that people make slighting remarks about her.

The patient is the youngest in a family of three. Pregnancy and delivery were normal, and she walked and talked at the average age. She did not show any particular deviations from normal up till school age, although she did have very severe temper tantrums from 3 until 8 years of age. At school she was an over-active child with impulsive conduct at times, and, at the age of 10 years we have a record of a time when she was slapped by the teacher, after which she screamed, turned blue, and fell to the floor apparently unconscious for some time following. The fact that the teacher let her remain on the floor is also illuminating. When she was 12 years old she went to the parish priest with the complaint that other children at school talked about her and said bad things about her; also that noises at night kept her awake. This was investigated, and it seemed that the girl was simply absorbing some of her mother's strange ideas. However, the child continued these complaints. At school she grew more and more unpopular, had to be leader in games on the rare occasions when she would join in, and was noted for striking other children impulsively for no apparent reason. At the age of 12 she was promoted to the fourth book, and after that made no progress whatsoever. One month before ad-

mission to hospital she refused to go any more to school. She would remain in the house, and if any visitors came would hide in the corner of the room and cover her face with her hands. She was always starting things and leaving them to begin something else, and was seen wandering from room to room in an agitated manner. By this time she was replying to auditory hallucinations. The mother had a violent temper, and became enraged when she refused to eat, finally trying to push a glass of milk into her mouth. In the struggle the girl lost two teeth, the glass was broken, and her chin was cut, which led to a physician being called, for the first time, and her subsequent admission to a mental hospital.

In hospital it was necessary to tube-feed her, and she remained in the stuporous condition already described from November till January, when she became excited, singing hymns and undressing in front of the windows. She was at first very unstable, noisy, hyperactive, meddling and mischievous, but gradually cleared up. In July, having received word that the mother had cleared up mentally, she was sent home on probation, but she was returned in October, said to be violent, with impulsive conduct and suffering from auditory hallucinations. At present she is in bed, hiding her head under the sheet when anyone approaches her.

The etiology in this case would certainly include the distressing family relationships, and the constant association with the psychotic mother would teach the child the same bad habits of reacting to reality, as well as influence her by constant manifestations of the more dramatic symptoms of mental illness. Whether or not there is also a constitutional factor is difficult to say.

Morgan⁸ suggests that the different types of schizophrenic illnesses have different antecedent conduct disorders in childhood, and suggests that catatonic schizophrenia is often preceded in childhood by "incoherent conduct"—much activity without accomplishing anything. He contrasts this with the listless, lazy, tired-out attitude towards life that the simple or the hebephrenic incipient schizophrenic shows, but points out that in both types there may be irritability, periods of excitement and depression, mannerisms, conduct peculiarities, etc.

The following case illustrates the mechanisms that can be brought into being by a very young child in an attempt to ignore reality.

CASE 2

E.P., a female, aged 3 yrs. 4 mos., was referred by the Children's Aid Society for routine examination. Physically she was of normal development, but she had a left internal strabismus, with independent movement of the left eye at times. She sat in the examining room in a heap, just as she had been placed when she was carried in. She showed no spontaneous activity of any sort, and would remain in any position in which she was placed for an indefinite period. She showed definitely the condition of *cerea flexibilitas*. After much effort, we succeeded in having her repeat three syllables after us, and toward the end of the interview she repeated, parrot-like, the first two or three syllables of anything that was said. She reacted so little to ordinary visual stimulation that

one suspected blindness, but she would blink when threatening objects were brought close to her eyes.

The matron reported that her conduct had been similar to this since her admission to the Shelter one month previously, when she and eight of her brothers and sisters arrived. She had been placed in one corner of the playroom and would be found there in the same position gazing at the floor, oblivious to everything, hours later. She had to be led to meals and fed—led to the bathroom and put on the toilet—led to bed, undressed, and tucked in. Shortly before our examination the matron found that if she led the child to the door of the playroom she would walk to the darkest corner, and sit there, as before. A few days later she developed a mannerism of touching one corner of the fireplace on her way to her corner.

The mother is at present a patient in the Ontario Hospital, Brockville, diagnosed as a mental defective with psychosis (moron group). The father has been in gaol at least twice. The child is the eighth in a family of ten.

We are dealing, in this case, with a child of less than 2 years mental age. Negativism is the most marked symptom. In this case it seems to be an attempt to ignore reality altogether by shutting out all external impressions. The condition of waxy flexibility seems to be a transmission of this psychic trend to the motor system.

The institutional routine at the Children's Aid Society Shelter was the first big factor in treatment. When the child knew what to expect every day, and got used to the large numbers of strange, noisy, and terrifying children around her, she began to realize that life

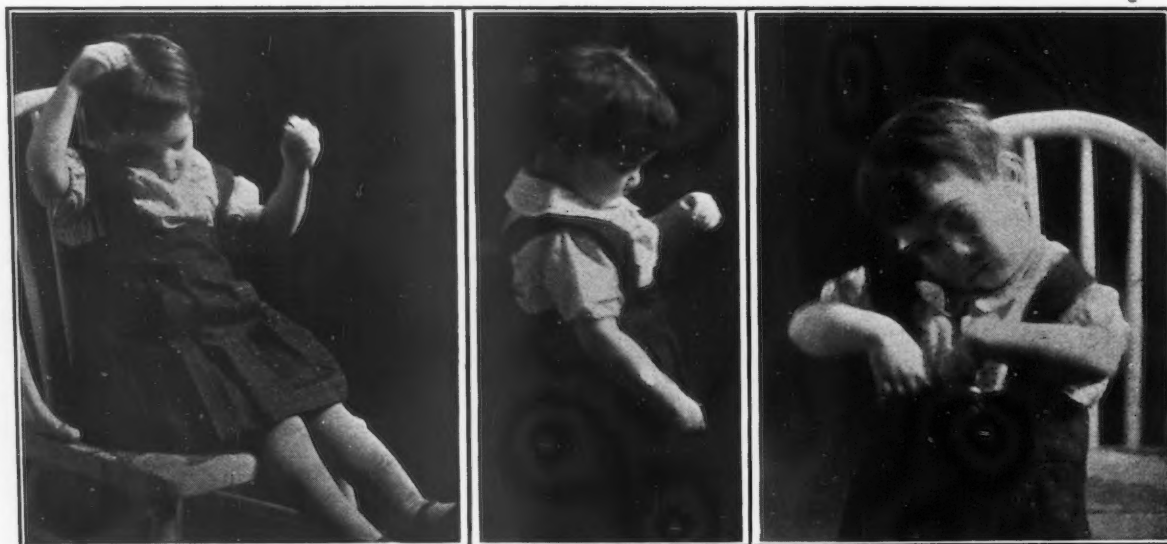


Fig. 1. Case 2.—Cataplectic phenomena.

From the history obtainable we learn that development of this child was somewhat retarded, and that enuresis was still present. The mother told us that the child was very quiet, never laughed or cried much, and was very obedient. At home she had been in the habit of feeding herself, but never learned to wash or dress herself.

The treatment in this case was rough and ready, rather than scientific. Frequent visits, at first with the child alone, with efforts to intrigue her interest with brightly coloured candies and occasional toys, succeeded, after a month or two, in gaining some confidence. After this, we dropped in occasionally, and included her two next oldest sisters (aged 5 and 7) in the interview. About the first of June she surprised us by picking up a ball that her sister, Anna, had thrown, and attempted to throw it back. The next day she very timidly got into the swing with Anna, and thereafter there was daily improvement. On June 20th a Kuhlmann test was done, which indicated a mental age of about 21 months. She was definitely hostile to strangers at this time, and had lost her apathy and indifference almost completely. Now, in November, she runs around, is quite noisy, takes part in games with her sister, is hungry at meal-times, feeds herself and partially undresses herself for bed. She is gradually taking on small responsibilities. The condition of cerea flexibilitas gradually disappeared; in June a slight tendency was shown towards it, but now there is none whatever.

was not so bad after all, and began to take some interest in her surroundings.

CASE 3

P.B., a boy of 17, seen at the clinic and admitted to mental hospital in December, 1934. The case was diagnosed schizophrenia of catatonic type. There was a neuropathic family history, three immediate relatives suffering from frank psychoses. The boy had been peculiar since the age of 12 years, and sick for the last two years. His history showed that he got along passably at school till 12 years, when he ceased to advance in his studies. He never received physical punishment at school, but reports always read "lack of interest and concentration". This boy never had any close friends and never showed any interest in girls. He was careless about his dress and appearance, but not interested in games, though he liked swimming. At 15 years of age he suddenly refused to go to school; children made fun of him on the street and some time later he thought people were following him. Consequently he stayed much in his room and refused to go out and meet anyone. He complained of vague pains and aches. About six months before hospital admission he complained of hearing voices from the window, would wet or soil his bed because he was afraid that someone was waiting to kill him in the bathroom. He refused to change his clothes, and, in November, when his father

and mother removed a dirty shirt by force, he proceeded, systematically, to wreck the room. Only then was a physician called—five years or more too late.

CASE 4

E.B., a boy of 10 yrs. when first seen at the clinic, had been referred for stealing, masturbation and pathological lying for which he had been expelled from school. The history was that boy was born out of wedlock, the putative father later marrying the mother because of pressure by social agencies. The father is alcoholic and unstable, unable to work. The maternal family shows two epileptics (grandfather and maternal uncle), and the mother gives a history of sex delinquency from 12 years of age. Home is the scene of constant conflict with actual physical violence almost daily, the police having to be called in often.

The school record showed that in the past five years he had been in five different schools and under eight different teachers. He repeated several grades (was in Grade III at 10 years). He had never earned a clear cut promotion, showed lack of interest in school, and was considered "sneaky", but had not been punished for aggressive conduct. On examination he was restless and fidgety, attention wandered. He had a mannerism of pulling at his eyelids. We did not feel that we had secured any rapport with him whatsoever.

The schools refused to admit him, since he had been expelled for masturbating openly, and, in consequence, he was admitted to a training school. He returned from there two years later, full of "pep", and a different boy altogether. Unfortunately he had to return to his home, which is still full of conflict, and after two years there, regressed again, through an anti-social to an asocial state. One year ago foster home placement was advised. This was done and our last report shows definite improvement. He passed his entrance in June and is now attending high school.

Richmond⁹ stresses the fact that the behaviour problems in children which precede schizophrenia are total personality reactions. The child is considered "queer" or "odd", and his playmates "fear" or "deride" him. Those in contact with him have great difficulty in securing any effective "rapport". Other findings are often cruel or senseless conduct with no regard for punishment. The child shows a lack of normal social contacts, and is often solitary and "plays queer games with himself". Shiftlessness, and lack of any sense of responsibility, shown by running away from school or home, cause his teachers and others to consider him dull or defective.

TREATMENT

Lurie¹⁰ cautions us that we must not use symptomatic treatment in behaviour disorders, and stresses, first of all, the elimination of or treatment of all physical defects. Seventy-five per cent of his 1,000 cases had an organic background and responded to medical treatment. In 25 per cent the treatment was purely by psychotherapy and social readjustment. It is important, in treatment, to concentrate on the child's assets.

Potter¹¹ shows, in treatment, that in most cases a feeling of insecurity must be modified by building up the child's confidence. A sense of humour is very important in the physician, as these children tend to take themselves quite seriously. Individualized treatment is necessary, and consists of (a) re-education measures, consisting of instituting a full daily regime for each child, establishing regular habits, and giving the child responsibilities, little by little; (b) direct psychotherapy, which needs rapport with the child and the ability of the examiner to look at things from the child's viewpoint. The child will eventually discuss what he thinks are the important things, but if the physician brings up these subjects the child will infer that the physician has the same viewpoint as his father and mother. Potter's technique includes, (a) interview—exchange of ideas; (b) phantasy method of relieving emotional tension; (c) play—the child uses various playthings in presence of the psychiatrist alone, living through his conflicts in symbolic fashion, thus relieving emotional tension.

Kanner¹² points out that in dealing with problem children the parent often misses the essential problem, and in treatment it is often more necessary to concentrate on the parents than on the child. He stresses the broad viewpoint and the sense of humour needed by the psychiatrist.

CONCLUSIONS

1. The total personality of the child must be considered in every case of behaviour disorder. It seems agreed that certain symptoms—seclusiveness, vagueness of thinking (lack of direction) evasion of responsibilities, cruel and senseless conduct, etc., are some of the danger signals of schizoid trends, but any of these may be found in many so-called "normal" personalities.

2. Persistent instinctive frustration leads to a tendency to try and ignore unpleasant things. It appears to be agreed that any attempt to withdraw from reality is a sign of mental ill-health.

3. Negativism is probably an expression of ambivalence. In one of our cases the child appeared to be wavering between strong likes and dislikes, *i.e.*, wanting to join in play; afraid of not being accepted by the group; bewildered

by opportunities; finally doing nothing except to shut out as much as possible the conflicting possibilities. This is a disorder of association, tending to pass to personality disintegration, and as such is another danger signal.

4. Even if there is a group of "constitutional schizophrenics" with neuropathic tendencies, sane treatment and favourable environmental influences should be able to do much in at least deferring the onset of a psychosis.

5. In treatment, rapport with the child, re-education, in the direction of the formation of regular habits, and a careful physical examination, with consideration of possible endocrinological abnormalities, are necessary. Following this we must build on the child's assets, helping him by his achievements to find satisfaction

with himself, thus guiding him along the road to mental health.

REFERENCES

1. KRAEPELIN, E.: *Dementia Praecox*, E. & S. Livingstone, Edinburgh, 1919.
2. KASANIN, J. AND BOWMAN, K.: Constitutional schizophrenia, *Am. J. Psychiat.*, 1933, 90: 645.
3. HOCH, A.: Constitutional factors in the dementia praecox group, *Rev. Neurol. & Psychiat.*, 1910, 8: 463.
4. BOND, E. D. AND ABBOTT, E. S.: Comparison of personality characteristics in dementia praecox and manic-depressive psychoses, *Am. J. Insan.*, 1912, 68: 359.
5. BLALOCK, J. R.: Personality and catatonic dementia praecox, *Psychiat. Quarterly*, 1932, 6: 625.
6. PAGE, J., LANDIS, C. AND KATZ, S. E.: Schizophrenic traits, *Am. J. Psychiat.*, 1932, 90: 1213.
7. POTTER, H. W.: Schizophrenia in children, *Am. J. Psychiat.*, 1933, 89: 1253.
8. MORGAN, J. J. B.: *The Psychology of the Unadjusted School Child*, Macmillan, N.Y., 1935.
9. RICHMOND, W.: The dementia praecox child, *Am. J. Psychiat.*, 1932, 88: 1153.
10. LURIE, L. A.: The medical approach to the study of behaviour disorders in children, *Am. J. Psychiat.*, 1935, 91: 1379.
11. POTTER, H. W.: Treatment of problem children in a psychiatric hospital, *Am. J. Psychiat.*, 1935, 91: 869.
12. KANNER, L.: Significance of the complaint factor in child psychiatry, *Am. J. Psychiat.*, 1933, 90: 171.

THE PROBLEM OF MATERNAL MORTALITY*

BY KARL M. WILSON, M.D.,

*Department of Obstetrics and Gynecology, University of Rochester,
Rochester, N.Y.*

MAY I preface my remarks on the problem of maternal mortality by offering you a biblical reference. In the 35th chapter of Genesis we learn that Jacob's wife, Rachel, failed to survive the birth of her last son, Benjamin, and, again, in the 4th chapter of 1st Samuel the death of Phineas' wife is recorded after the birth of her son, Ichabod. The exact causes of the deaths of these two women cannot be stated, but the manner of their deaths rather suggests post-partum hæmorrhage. I cite these two historic examples of maternal death to show what an age-old problem it is that we are discussing.

Coming down to the present day, we recognize the unfortunate fact that the mothers of the land are called upon to pay an appalling price in human lives for bringing their children into the world, in order that the race may survive. At the outset we will probably have to admit that the occasional, unpreventable death will occur during childbirth, even when the patient is given the most expert care, but this should be a most rare occurrence, rather than one occurring with the appalling frequency

which we observe today. You are all familiar with Dr. Chipman's aphorism, "The process of parturition is the same in the countess as in the cow". Very true, but, unfortunately, the results are infinitely better in the cow than in the countess.

For a proper understanding of just what this problem of maternal mortality means it will be necessary to present a few figures. The following table compiled by the Children's Bureau of the United States Department of Labour gives an idea of what the situation is in the United States and certain other countries.

From this we recognize the unfortunate fact that the maternal death rate in many countries, and particularly in the United States, is much higher than it ought to be, and that thousands of lives of young women are unnecessarily sacrificed annually. It behooves us therefore to inquire carefully into the possible factors which bring about these unfortunate results, and from the information thus obtained learn what measures may be adopted to improve the situation. My comments on conditions will refer to the United States, as I am more familiar with the situation there, though, so far as I can gather, the situation is only slightly better on this side

* An address given before the Montreal Medico-Chirurgical Society on January 17, 1936.

COMPARABILITY OF MATERNAL MORTALITY RATES
TREND OF MATERNAL MORTALITY IN THE UNITED STATES AND CERTAIN
FOREIGN COUNTRIES; 1925-1933

Country	Deaths assigned to pregnancy and childbirth per 10,000 live births**								
	1925	1926	1927	1928	1929	1930	1931	1932	1933
THE PUERPERAL STATE									
†United States.....	64.7	65.6	64.7	69.2	69.5	67.3	66.1	63.3	61.9
Australia.....	56.4	53.0	59.2	59.8	50.8	53.0	54.8	55.7	51.3
Canada.....	56.4	56.6	55.5	56.2	57.0	57.7	50.5	50.2	*49.7
Chile.....	61.1	58.3	57.7	58.6	77.8	67.7	75.0	71.0	....
Czechoslovakia.....	33.3	34.0	35.8	39.7	42.8	40.7	41.4	*42.8	*48.5
Denmark.....	23.6	26.6	30.6	27.0	31.7	38.3	40.5	35.0	36.5
England and Wales.....	40.8	41.2	41.1	44.2	43.4	44.0	41.1	42.1	*43.2
Estonia.....	38.2	40.5	41.1	50.3	46.0	49.3	42.5	33.9	....
†France.....	23.8	24.4	28.7	29.0	29.3	26.7	24.9	....	....
Irish Free State.....	46.9	48.9	45.1	49.3	41.0	47.6	43.1	45.5	....
Italy.....	28.1	25.5	26.4	28.0	28.8	27.2	27.8	29.8	....
Netherlands.....	26.3	28.7	29.0	33.6	33.5	33.3	32.0	30.2	*31.6
New Zealand.....	46.5	42.5	49.1	49.3	48.2	50.8	47.7	40.6	44.4
Northern Ireland.....	44.4	56.1	48.0	52.4	49.2	52.9	51.4	53.4	....
Norway.....	26.8	31.8	24.5	30.3	36.2	30.3	27.0	26.4	....
Scotland.....	61.6	64.0	64.3	69.8	68.7	69.5	59.1	63.3	59.2
Sweden.....	26.3	29.4	27.8	33.0	37.9	34.8	36.8	*26.6	....
PUERPERAL SEPTICÆMIA									
†United States.....	24.3	24.2	25.0	25.0	26.4	24.0	24.6	23.0	23.5
Australia.....	17.4	16.4	21.5	20.5	17.1	18.8	21.1	21.9	20.9
Canada.....	16.8	18.6	19.1	18.5	19.6	20.6	18.0	*17.3	*16.7
Chile.....	15.0	15.7	19.6	20.7	33.6	28.1	....	28.5	....
Czechoslovakia.....	14.3	13.1	19.7	24.3	23.6	22.6	21.0	*25.2	*26.6
Denmark.....	9.1	10.9	10.5	11.7	10.0	11.8	12.6	10.7	13.1
England and Wales.....	15.6	16.0	15.7	17.9	18.0	19.2	16.6	16.1	*17.5
Estonia.....	3.9	4.0	8.6	10.5	7.3	23.1	13.3	10.1	....
†France.....	9.3	9.7	11.4	11.0	11.6	9.8	8.7	....	....
Irish Free State.....	16.9	18.8	12.8	17.4	13.7	13.9	11.6	13.9	....
Italy.....	10.2	8.4	9.1	9.4	9.2	8.8	10.6	11.7	....
Netherlands.....	8.6	9.3	8.9	9.4	13.3	11.4	10.2	9.1	* 9.4
New Zealand.....	14.9	13.7	25.1	20.6	18.3	21.3	17.7	15.7	16.4
Northern Ireland.....	9.8	17.4	18.0	15.0	14.6	15.1	16.7	15.5	....
Norway.....	7.8	10.0	10.2	16.2	19.0	14.0	11.1	10.1	....
Scotland.....	16.4	16.9	19.0	24.2	23.8	23.4	22.6	26.7	24.5
Sweden.....	12.2	16.0	12.7	17.9	20.6	18.6	18.2	*10.1	....
ALL OTHER PUERPERAL CAUSES									
†United States.....	40.4	41.4	39.7	44.2	43.2	43.3	41.5	40.3	38.4
Australia.....	39.0	36.6	37.7	39.3	33.7	34.1	33.8	33.8	30.5
Canada.....	39.6	38.0	36.4	37.7	37.3	37.1	32.5	*32.9	33.1
Chile.....	46.1	42.6	38.1	38.0	44.2	39.6	....	42.5	....
Czechoslovakia.....	19.0	21.0	16.0	15.4	19.2	18.2	20.4	*17.6	*21.8
Denmark.....	14.5	15.7	20.1	15.3	21.7	26.5	27.9	24.3	23.4
England and Wales.....	25.2	25.2	25.4	26.3	25.3	24.8	24.5	26.0	*25.7
Estonia.....	34.2	36.5	32.5	39.9	38.7	26.2	29.2	23.8	....
†France.....	14.5	14.7	17.3	18.0	17.7	16.9	16.2	....	....
Irish Free State.....	30.0	30.1	32.3	31.9	27.3	33.8	31.5	31.7	....
Italy.....	17.8	17.1	17.4	18.6	19.6	18.4	17.3	18.0	....
Netherlands.....	17.8	19.4	20.0	24.1	20.3	22.0	21.8	21.1	*22.2
New Zealand.....	31.6	28.8	24.0	28.7	29.9	29.5	30.1	24.9	27.9
Northern Ireland.....	34.7	38.7	30.0	37.4	34.6	37.9	34.7	37.8	....
Norway.....	19.1	21.8	14.3	14.0	17.2	16.3	15.9	16.3	....
Scotland.....	45.2	47.1	45.3	45.7	44.9	46.1	36.5	36.6	34.7
Sweden.....	14.1	13.4	15.1	15.1	17.3	16.2	18.6	*16.5	....

**Figures from official sources.

†The United States birth-registration area expanded from 33 States in 1925 to 48 States in 1933.

*Provisional.

†Based on total births reported as live.

of the line. There are a number of factors that we can readily recognize as having an influence on the number of unnecessary maternal deaths—all are important, but some have a greater bearing on the situation than have others. I will discuss some of these factors briefly, others in greater detail.

The *abortion problem* is one which has been with us almost since history began. We have no available means for ascertaining the frequency with which criminal abortion is carried out. The number of such procedures, however, is tremendous, and, unfortunately, is very definitely on the increase. It has always seemed a little unfair to me that statisticians should include deaths from this cause in the general maternal mortality. The patients of this type whom we physicians see are the ones who are seriously ill as the result of hæmorrhage or infection, and a fairly high percentage of the women die whatever line of treatment is followed. These deaths surely should not be laid at our door, even though they are deaths that are connected with the child-bearing function. In my experience it is not so much the young girl who is illegitimately pregnant who is the chief victim of the abortionist, but rather is it the mother of several children, who, discovering herself again pregnant, decides to get rid of the unwanted child by a self-induced abortion or by a visit to the professional abortionist. I am not clear as to the solution of this angle of our problem—most assuredly it is not legalized abortion as practised in Russia. Efforts to bring the professional abortionist to account for his crimes have already been notoriously inefficient. Probably here again an educational campaign might prove of value to teach the laity the menace to health and life that is involved in criminal abortion.

Another group of women who contribute materially to the mortality rate are *those who should never have been allowed to become pregnant*. I am not one of those who believe that all the ills of the human race would be solved if a wider distribution of contraceptive knowledge were permitted; the fact remains, however, as we all know, that women suffering from chronic nephritis, severe cardiac lesions, and pulmonary tuberculosis are literally taking their lives in their hands if they allow themselves to become pregnant. These three diseases are the outstanding examples of those in which the occurrence of pregnancy brings a menace to

life, but the group may be enlarged when we consider individual cases. This group can be controlled only by discovery of the existing disease before pregnancy occurs, and then proper steps are taken to insure the fact that pregnancy will not occur.

Another important factor in the high maternal mortality is the unfortunate increase in operative procedures to effect delivery, so often entirely unnecessary, and every one of them representing an added menace to the woman. This operative furore is entirely a development of ultra-modern obstetrics—almost unknown a generation ago. What is the reason for it? Is it because the modern woman cannot or will not stand pain as her mother did? Is it the result of medical competition? Or is the whole situation a result of the abnormally strenuous lives we lead in this day and generation? Unfortunately, some of the outstanding men in our profession advocate frequent operative interference with the course of labour. When the average physician hears such men urging the performance of prophylactic forceps, prophylactic versions, and what not, what is he to think? His likely reaction is to feel that he is behind the times unless he treats his patients in a similar manner. After all, what are these prophylactic measures designed to prevent? As I see it, all they prevent is spontaneous labour, and in so doing a great deal of harm is done. The master of the obstetric art may be able to show reasonably good results attending his operative procedures, but the average man with little or no training who attempts to imitate him brings only disaster to himself and his patients.

Possibly, the most abused operative procedure of today is Cæsarean section. At times it would almost seem that the indications for this operation have been so broadened that the only requisite for its performance lies in the fact that the woman be pregnant. The Cæsarean section problem has undoubtedly arisen from the fact that technically the classical operation is not a difficult procedure to carry out. It is therefore resorted to on what are frequently trivial indications, and, worse yet, it is so often done at an improper time. This latter point is one to emphasize as having a very particular bearing on the unnecessarily high mortality which attends this particular procedure. Cæsarean section of the classical type, done as an elective operation, or at the onset of labour in

the clean case, ought to have an operative mortality of between 1 and 2 per cent. This has been clearly shown in the figures presented by the late J. Whitridge Williams. On the other hand, the operation performed later in labour will carry an operative mortality of from 10 to 15 per cent, while if performed after attempts at delivery from below have been made, the mortality ranges from 25 to 30 per cent. These figures are substantiated by all men who have studied the subject from this angle. Time will not permit a more comprehensive review of this phase of the subject, but studies by Eardley Holland, Williams, Reynolds, and others present indisputable evidence to support the fact that the classical operation done at any other time than before labour sets in or at its onset is a dangerous procedure. Unfortunately, this fact has not been grasped by the profession as a whole, so we still see an average mortality of 10 to 15 per cent as the penalty attached to Cæsarean section. A favourite topic of the late J. Whitridge Williams was this very question of the abuse of Cæsarean section, and he concludes one of his numerous papers on the subject with the following statement—"What we need in this country are more thoroughly competent obstetricians and fewer skilful but indiscriminate surgeons".

Among the frequent causes of maternal death are the toxæmias of pregnancy. Until we have learned the exact etiology of these the treatment must be along more or less empirical lines, but we must be able to recognize the symptoms which indicate their onset. Failure to attach due importance to what may at first appear as comparatively slight symptoms too often results in the development of a severe grade of toxæmia which may result fatally. Eclampsia, in my opinion, is to be regarded as a preventable disease, though with our present state of knowledge not quite 100 per cent so, and we still see the occasional acute fulminating case of this disease occurring during pregnancy or labour without previous symptoms of toxæmia having been present. Our present knowledge does not permit the prevention of this type, though fortunately such examples are of rare occurrence. However, recognition of the premonitory signs and symptoms, perhaps at first only a slight degree of albuminuria with moderate elevation of blood pressure, should

call for careful observation and therapeutic measures. Failure to respond to the simpler measures may necessitate termination of the pregnancy by the induction of labour to avert impending eclampsia. I would mention specifically that Cæsarean section has no place in the treatment of eclampsia except in the event of some associated mechanical obstacle in the pelvis, but there are still too many Cæsarean sections performed for this indication, with an operative mortality added to that of the toxæmia itself.

A question that arises not infrequently is that of the comparative safety of home or hospital delivery. It is difficult to obtain accurate figures for comparison along these lines, but let us admit for the sake of argument that the death rate is somewhat higher in the hospitals as compared with home deliveries. The explanation for this is perfectly obvious, and lies in the fact that lying-in hospitals care for not only their own patients but also receive a large number of emergency patients who are already infected or in poor condition at the time of their admission. This naturally increases the mortality attributed to the hospital. We must also admit, however, that in the hospital, with the segregation of patients, conditions would be favourable for the spread of infection should an active infection develop in a single patient. Prevention of this means constant vigilance on our part in so far as our technique is concerned, and particularly prompt isolation of the infected or suspected case, and the prompt removal from duty of any attendant who may be a potential cause of infection. I would also mention the small rural hospital, of which we are seeing an increasing number. Many such institutions have able staffs and excellent work is done in them, but, on the other hand, they at times become a haven for the incompetent. They must be closely supervised.

While an increasing number of women are desirous of receiving hospital care at the time of delivery, of necessity a larger number of women are cared for in their homes, and this will probably always be true, particularly in rural communities. There is no reason why this should not be so, provided that conditions in the home are satisfactory. The results will be good or bad depending on the surroundings and, particularly, according to the ability and

care of the medical attendant. One of the best examples of such work that I am familiar with is the work of Mrs. Mary Breckenridge in the Kentucky mountains. Under most primitive conditions she and her group of English trained nurse-midwives had up to the summer of 1935 cared for 2,000 women in labour. In this series two maternal deaths occurred—both in cardiac patients—none from infection—an excellent record.

I have discussed a number of the factors that I believe have an influence on the unnecessarily high maternal mortality, but after all the most frequent cause of death is puerperal sepsis—a preventable disease. If we recall our obstetrical history, we remember that Charles White, of Manchester, Alexander Gordon, of Aberdeen, Semmelweis, and Holmes, wrote on the preventibility and mode of transmission of this disease, but their writings produced no effect other than ridicule on the part of their contemporaries. The lack of improvement in the results insofar as puerperal infection is concerned would make it appear evident that the modern physician also ignores the fundamental features involved in the prevention of infection.

We may have to admit the possibility of the occasional occurrence of so-called autogenous infection in the woman who has harboured pathogenic organisms in her body before labour began. In my opinion this is of infrequent occurrence, and the great majority of infections result from the introduction of organisms into the birth canal at the time of labour. The responsibility for this must be accepted by those who are in attendance on the woman at this time. Watson has drawn attention to the importance of the respiratory tract of the attendants as a point of origin for the introduction of infection. It is obvious therefore that doctors, nurses, and students suffering from respiratory infections or who harbour streptococci in their throats should be excluded from contact with the lying-in woman. Those in attendance should be properly masked.

More important however is the problem of contact infection from the hands or instruments. Until every physician doing obstetrical practice grasps the fundamental fact that every time he introduces fingers or instruments into the birth canal of the woman during labour, he is exposing her to the possibility of infection,

just so long will we see a high incidence of puerperal sepsis and resultant deaths. The competent physician should be able to conduct the normal delivery without so much as putting a finger in the vagina. Abdominal palpation will reveal the presentation and position. The descent of the head can be traced by abdominal manœuvres. To the experienced observer, the character of the pains or the behaviour of the woman will indicate when the second stage has arrived. If he feels that he must learn the condition of the cervix before this time a rectal examination will give him this information, but even rectal examinations are not to be regarded as being entirely innocuous and should be restricted to a minimal number. If vaginal examination does appear indicated, or interference does become necessary, the most scrupulous aseptic technique should be observed. All this probably sounds to you like kindergarten teaching in obstetrics, and yet it is the neglect of these simple fundamentals that is responsible for much of our trouble.

I would mention one other mechanism by which infection may be introduced into the birth canal. This was brought forcibly to my attention several years ago as the result of a death from infection which occurred on my own service. The patient, a normal multipara, was admitted to the hospital, near term, on account of what proved to be false labour. After a week's stay she was discharged. She was readmitted a week later in active labour and was delivered spontaneously after a short, easy labour, no internal examinations or manipulations of any kind having been carried out. Thirty-six hours later she had a chill, became seriously ill, and died from a streptococcal infection. We felt there had been no break in our technique and inquiry revealed the fact that intercourse had occurred just before she came to the hospital at what proved to be the onset of labour. Since this experience we have made inquiry along this line in all patients showing an unexpected rise of temperature in the puerperium and have been rather surprised to learn the frequency with which coital infection apparently occurs. This of course is not new, but in the past I do not believe sufficient attention has been paid to it. It represents one more point which should be stressed in the pre-

natal advice we give our patients, particularly the uneducated group.

I have presented certain facts in regard to the high maternal mortality in the United States and have discussed some of the reasons for it. The situation is a deplorable one, particularly because such a high percentage of the deaths must be regarded as preventible. The best idea as to the actual percentage of preventible deaths as compared with total deaths is to be found in the report issued by the New York Academy of Medicine in 1933. In the years 1930, '31, '32 there were 2,041 maternal deaths in New York City. The investigating committee, after careful study of the records, decided that of these 1,343, or nearly two-thirds, could be fairly classed as preventible. Of the deaths so classified, the responsibility for preventibility was ascribed to the physician or midwife in 850, or 63.3 per cent, and to the patient herself in 36.7 per cent. These figures are for New York City, but may well be regarded as a fair index of the general situation in so far as preventibility and placing of responsibility is concerned. In fact a similar study in Philadelphia in 1934, though conducted on less rigid lines than the New York study, showed comparable findings. These studies, though resulting in considerable criticism of those who participated, have served a most useful purpose in focusing public attention, both medical and lay, on the situation, and should eventually result in considerable good being accomplished.

Having recognized what the situation is, what, if anything, can be done to bring about improvement? We would be in a sorry position, indeed, if we were to admit that conditions cannot be bettered. As I see it, the situation is one which is squarely up to the medical profession, through we must have the strong support of the general public in the matter. We are all aware of the importance of proper pre-natal care for the pregnant woman. Standards to be followed have been presented many times, and I will not take the time to enumerate them here. However, the most elaborate preparations for the proper supervision of patients during their pregnancies will result in no benefit unless the women concerned avail themselves of the opportunities that are offered. From this standpoint, the situation is better than a

generation ago, but there are still far too many women who make their first contact with a physician at the time of labour. In order that women may be induced to avail themselves of the opportunities offered, a persistent educational campaign will be necessary, in order that all may be made aware of the necessities of proper pre-natal supervision and of the opportunities for such care that are available. In such a campaign, we should have the cooperation of national and local medical societies, lay organizations that are interested in maternal welfare, and, particularly, we should have the support and cooperation of the public health bureaus and the local health officers. After all, this matter is most decidedly to be regarded as a public health problem.

Important as is the matter of pre-natal care, of still greater importance is the problem of adequate training of those physicians who will care for obstetrical patients. In those European countries presenting the lowest maternal death rates, France, Norway, Sweden, Holland, and Denmark, a high percentage of lying-in women are cared for by nurse-midwives who have received a very considerable practical training. I have heard it seriously suggested as a solution of the problem of maternal mortality that schools for midwives be established in the United States. In my opinion this is evading the issue, and while many deaths are attributed to the poorly trained midwife, many more result from inexperienced care on the part of the poorly trained physician.

In so far as obstetrical instruction is concerned we have travelled a considerable distance since that time in 1850 when Dr. James P. White, of Buffalo, was the first to conduct a delivery before a group of medical students, and as a result of his courage suffered the fate that has overtaken so many medical pioneers. The rate of progress, however, has been pitifully slow, and we have still a long road ahead of us. As a commentary on the teaching of the time, Dr. Williams, graduating in 1888, used to tell with considerable glee how he won the obstetrical prize in his class after seeing exactly two deliveries. My own undergraduate instruction, twenty-six years ago, consisted in witnessing four deliveries in their final stages and the palpation of the abdomens of two pregnant women, the second one at the final

examination, while I never had a pelvimeter in my hand. One of the important features of the White House Conference, held several years ago in Washington, was the recognition of the fact that obstetrical instruction, both undergraduate and post-graduate, in many of our schools is woefully inadequate. Improvement in teaching involves the allotment of an adequate number of hours in the medical curriculum to obstetrics. In so far as didactic instruction is concerned this becomes a matter of adjustment between the various clinical departments of the school, and should not be too difficult, provided the colleagues of the professor of obstetrics have been educated to the point of recognizing that obstetrics is a subject of major importance to the undergraduate; that the latter will be entering on the practice of medicine shortly, and that he will be caring for lying-in women long before he is called upon to perform laparotomies. Didactic instruction, however, must be supplemented by adequate clinical training, which is not so readily arranged except in the large clinic. The student's clinical training should include sufficient time in the out-patient department to learn the rudiments of diagnostic procedures, pelvimetry, and to grasp the principles of pre-natal care, at the same time learning that eclampsia is to be classed with the preventable diseases. He should observe the conduct of deliveries in the hospital for a time, grasping the principles of the management of labour during its three stages, at the same time absorbing the principles of aseptic technique. Observation of the final stages of delivery is not enough. The student should be permitted to follow the patient from beginning to end, thus learning what labour really means, and he should be permitted to follow the course of events in the puerperium. He should also have the opportunity of studying those patients who present abnormalities of pregnancy or labour, and to hear these less usual conditions discussed frequently at ward rounds. He should learn particularly that the various obstetrical operative procedures have been designed as life-saving measures for mother or child, and are not to be undertaken unless a definite indication on the part of either mother or child be present. This will be the beginning of his development of what may be described as an obstetrical conscience, which we will hope he

will develop still farther and retain throughout the period of his active professional career. After a period of observation he should conduct a number of deliveries himself under proper supervision. The number possible will vary according to the amount of material available and the number in the class undergoing instruction. It should be as large as possible. Exercises on the mannikin are of importance, but only as a preliminary to operative training. This is about as far as we can go in undergraduate work. Such a course of instruction will not give us a trained obstetrician, but one who has received this much training should at least be able to take care of the normal patient. The observation of a series of Cæsarean sections has no place in undergraduate instruction. For the man who plans to go into general practice in the course of which he will be called upon to care for a considerable number of obstetrical patients, further training is absolutely essential. He should obtain this training after graduation, during his period of hospital service, when he will learn more of the abnormalities and should have the opportunity of carrying out an adequate number of at least the simpler operative procedures. Institutions are recognizing more and more that in so far as their resident staffs are concerned the obligation is not entirely that of the intern to the institution, but that in appointing a young man to its staff the institution accepts a certain responsibility for his training.

I have said nothing about the training of the obstetric specialist. This should be combined with adequate training in gynaecology. I will not dwell on this phase of the matter further, except to emphasize that a long arduous course of training involving several years is necessary. The half-trained, self-styled "specialist" is often a menace to the community, and not infrequently is one who seeks to justify his existence by carrying out an unusual number of operative procedures.

I have dwelt on this question of the proper training of the physician who proposes to do obstetrical practice because I believe it is the fundamental question involved in our problem. Not until we produce better trained physicians, who will observe the simple fundamentals of aseptic technique and have a real obstetric conscience in so far as operative procedures

are concerned, will we get an improvement in our maternal death rate.

One other problem remains for consideration, and that is, what shall be done about the poorly trained men already in practice and who are responsible for so much of the difficulty. To handle this situation properly will require a high order of moral courage on the part of a good many people. The public health officials would appear to be those who are in the best position to know who are the ones in the various communities doing incompetent work. The man who turns in repeated death certificates on puerperal women should be held to strict accountability for his results, and somebody in authority should have the power to insist that such a one receive further training before continuing on his career. Professional ethics must not be used as a cloak to conceal incompetence.

As a corollary to these statements, however, we must recognize the fact that while many men practising obstetrics are poorly trained for the work they are called upon to do their poor preparation is often not their fault, but rather is due to the lack of opportunity to obtain better training. It therefore becomes the ob-

ligation of those of us who assume the responsibility for the teaching of obstetrics to see that the necessary facilities for post-graduate training are made available to those who seek it.

In conclusion, we recognize fully that the maternal death rate of the country is too high, and that a high percentage of the deaths that do occur are to be classed as preventable. Improvement in results must be brought about, and I am confident that this can be done. This will require cooperation on the part of all those who are concerned in the problem. Educational propaganda must be continued until all women learn the necessity of proper pre-natal supervision and present themselves for examination and care early in their pregnancies. Above all, the importance of adequate training for the physician who plans to do obstetric practice must be recognized, and our teaching institutions must accept the responsibility for seeing that it becomes possible for him to obtain the necessary clinical training. Improvement cannot be brought about over night, but serious effort by all of us along the lines indicated should result in a striking improvement in the results obtained.

MATERNAL DEATHS*

BY R. E. WODEHOUSE, M.D., O.B.E., D.P.H.,

Deputy Minister of Pensions and National Health,

Ottawa

MAY I extend the thanks of my Department to the Montreal Medico-Chirurgical Society for the privilege of again recording the interest of the Section of National Health on the subject of "Maternal deaths".

My residency in the Lying-in Hospital, New York, in 1908, brings pleasure to me now in reviewing Professor Wilson's interesting study of the City of Rochester's experience and national comparisons.

(1) Canada's maternal death rate is 5.3 per 1,000 live births. (2) I am convinced that 2 deaths per 1,000 live births are not chargeable to legitimate obstetrics. (3) Deaths in non-

spontaneous are four times higher than in spontaneous deliveries. (4) One-third of the maternal deaths occur before the third trimester. (5) Only one-half of the deliveries are full term.

What really is our interest in maternal deaths? Are all the doctors needlessly a factor in causing Canada's maternal death rate to be twice as high as in those cared for by the Victorian Order of Nurses, the Red Cross Society, and the Assistance Maternelle of Montreal? *This is not so.* These three services having maternal death rates less than half the rate for Canada deal usually with *full term pregnancies*. In Ontario only one-half of the deliveries are full term, and one-third of the deaths occur in the first and second trimester.

The three services deal mostly with mothers

* A contribution to the discussion of "Maternal Deaths" at a meeting of the Montreal Medico-Chirurgical Society on January 17, 1936.

wishing to have the best possible done for themselves and having hope for a living child; hence statistical comparison between Governmentally reported maternal death rates and those of the three services is unfair and casts a wrong reflection on the medical or obstetrical care in Canada.

Professional care of maternity cases is not scientifically difficult. All the practices have been laid down, and, if carried out without interference, allowed to be spontaneous, as by the Victorian Order of Nurses, the Assistance Maternelle and the Red Cross Outpost Hospitals, show rates of death of which the profession has a right to be proud. "Once an 'obstetric conscience' has been acquired, a doctor is proof against any amount of temptation to hurry or to interfere unnecessarily or to offend in any way against the cardinal principle of preservation of normality." (Holland, *The Lancet*, April 27, 1935).

How best can we get these satisfactory conditions operating in spontaneous deliveries, to help an increasing number of expectant mothers? The experience referred to by the *British Medical Journal*, February 16, 1935, and March 17th, 1935, in Rochdale, in the Black Country of England, was that the Medical Officer of Health's municipal maternal death rate was 10 per 1,000, and was reduced to 3.9 in two years by the splendid cooperation of the medical profession and others. Refresher courses for doctors, nurses and mid-wives were conducted. The public were told of the facts and urged to have expectant mothers of their households place themselves early in their pregnancy under the supervision of their doctors or the public health service, but, once the drop of 10 to 3.9 had been obtained, enthusiasm subsided and the rate increased again to 5 or more. Education of both doctors and the public was effective, but stimulus must be maintained.

It is considered that the education of the public to a point of realization of the differences which accrue from proper pre-natal, natal and post-natal care, compared with its absence where available, or where it is partial in amount and efficiency, will bring about a big change. We do not need to wait for any more highly developed technique. *Let us tell them at once what we know now.*

Let us ask the profession at once to assist us in two details at least, namely: (1) To discourage families and themselves in the use of any measures, instruments, etc., to hasten the completion of labour (non-spontaneous) where it is not absolutely necessary. Practitioners who reported 2,300 deliveries without a death took time to await nature and saved the mothers. Remind the families that non-spontaneous deliveries carry a maternal death rate *four times* that of spontaneous deliveries. (2) To discourage the people and themselves in associating the profession with measures which interfere with pregnancy before the fetus is viable. Remind them that one-third of our maternal deaths are due to misfortunes before the child is viable. Is it too much to ask that we ourselves endeavour to stop our fellows using means to bring about non-spontaneous delivery? Only a few of our profession do it. They cause most of our trouble. They are popularly known to the laity on account of this type of conduct. This also applies to delivery before the fetuses are viable.

My studies in 1920 showed that one doctor among eight reported 50 per cent of the still-births in one community. In another community one physician reported 58.3 per cent of the still-births and attended only 14.8 per cent of the mothers giving births which were registered. Is our profession to continue to be charged with inefficiency in obstetrics because we will not acknowledge that more than one-third of the deaths are due to wrong practice by a few of our practising brothers? Certainly we should attack the 1 or 2 per cent who are the "non-viable specialists". This will materially effect one-third of the deaths.

If puerperal infection follows the pneumonia curve, according to the studies of Dora C. Colbrook, Medical Research Council; or, aside from the above, are due to our cold winters, (see "Need Mothers Die?" 1935), may I suggest that:—

1. Cold in Canada causes closer contact in homes, in one or two rooms, for more hours each day than is the case at other milder seasons.
2. Infection established in virulent form is passed more easily at this season, and mild scorbutic tendencies carry decreased immunity reaction.
3. Fresh vegetables containing vitamin C are scarce or non-available to the majority. This

lack, in the laboratories of the Department of Pensions and National Health was found to account for interrupted pregnancies in guinea-pigs and death of the fetuses and the mothers. The supply of young fresh carrots, instead of matured winter stored ones or new green cabbage, changed this biological picture. The germ of wheat and the addition of ascorbic acid are found to be equally effective. Does the addition of this vitamin also increase body resistance to infection? It is thought so by our laboratory people. Should we tell them that Chinese cooks in lumber camps sprout the beans they eat themselves on wet woollen blankets over the ranges in the cook house?

Shall our leaders in obstetrical practice lend their expert knowledge to persuading, by extramural courses, all our doctors, nurses, etc., to adopt every known practice which will tend to correct the present maternal death rate? The campaign for breast-feeding worked wonders for

children who might have died from intestinal causes. Mothers who realized their babies might be more certain to live if they gave themselves over to the inconvenience of stimulating their production of breast-milk and nursing their babies, soon did so and saved thousands of babies. They will win another victory in reducing maternal deaths if our profession assists them and tells them the dangers of non-spontaneous deliveries.

These remarks are based upon outside service, Lying-in Hospital, New York, and studies in Ontario published by the *Canad. Pub. Health Ass. J.*, 1921, and Departmental use of the following reports:—

1. Rochdale, England.
2. Department of Health, Scotland, 1935.
3. British Medical Association Supplement, 1935.
4. Source of puerperal infection, 1935, Dora C. Colbrook.
5. New York Academy Study, *Med. Res. J.*, 1933.
6. Ontario Maternal Deaths, Phair and Sellars, 1934.
7. Jackson, Manitoba, 1934.
8. "Need Mothers Die?" 1935.
9. Observation—Laboratory animals, Department of Pensions and National Health, Chapman and Morrell, 1935.

CALCIUM AND PROTEIN STUDIES IN MALIGNANT DISEASE

BY R. O. BOWMAN, PH.D., H. C. PITTS, M.D., P. H. MITCHELL, PH.D. AND ELSIE EWERTZ, B.S.,

Providence, R.I.

NUMEROUS workers have tried to establish a relationship between calcium metabolism and malignant growth. Shear¹ has published a very critical review of the literature and he reaches the conclusion that changes in the calcium content of the blood in cancer are due to old age or cachexia. For years one of us, (H.C.P.), has been convinced that intensive calcium therapy aids in the treatment of malignancy. In a former paper from this laboratory² an attempt was made to show a calcium deficiency in the patient with malignancy. Though the blood showed a very small difference in calcium between normal and cancerous individuals, the blister fluid, which should more closely approximate the cellular content of electrolytes, showed a significant decrease in calcium in the cancerous individual as compared with the non-cancerous.

The present communication is a report on a further series of cases, with malignancy proved by biopsy, necropsy, or roentgenology, and hospital cases and normals with no evidence of

malignancy. In addition, we have a small number of calcium balance studies.

EXPERIMENTAL

A blister was raised on the chest wall with cantharides citrate paste, as described before.² Fasting venous blood samples were taken when the blister fluids were collected in the morning. Within a half hour these samples were centrifuged at high speed, to obtain serum and cell-free blister fluid. Calcium and inorganic phosphorus were determined in duplicate according to the method of Lowenberg and Mattice,³ using 2 c.c. of serum. Total protein was determined by a method to be published, a modification of the Denis and Ayer⁴ method for spinal fluid protein. Potassium determinations were run by the Jacobs and Hoffman procedure.⁵ Duplicate determinations were required to check within 0.05 mg. for Ca., 0.05 mg. for P, 0.1 g. for protein and 0.2 mg. for K, or more determinations were run. Reagents were standardized daily until changes were pre-

dictable and then often enough to rule out sources of error.

In the metabolism experiments we were handicapped by having no muffle furnace for ashing samples of faeces. According to the workers at the Massachusetts General Hospital, patients on a low-calcium neutral diet excrete calcium mainly in the urine. Patients for excretion studies had a fasting blood taken in the morning and were placed on the low-calcium neutral diet of Bauer, Albright and Aub⁶ for a period of six days. The diet tends to constipate bed patients so that soap suds enemas or a mineral oil laxative had to be

DISCUSSION OF RESULTS

In Table I the results of analysis of blood and blister fluid on cases with no evidence of cancer are given. Age is given in years; potassium, phosphorus and all calcium figures are in mg. per 100 c.c.; and protein in g. per 100 c.c.

The values in columns 6 and 12 are for total calcium, as determined by the Clark and Collip⁹ modification of the Tisdall method. Columns 7 and 13 give the total calcium values calculated from the formula of Peters and Eiserson,¹⁰ while columns 8 and 14 give calcium ion concentrations read off from a graph given by McLean and Hastings.¹¹ Arithmetical averages

TABLE I.
RESULTS IN NON-CANCEROUS CASES

Case	Age Sex	Serum						Blister Fluid					
		K	P	Prot.	Ca	Ca (calc.)	Ca ⁺⁺	K	P	Prot.	Ca	Ca (calc.)	Ca
17	25M	17.5	4.75	8.34	10.22	10.42	4.1	18.9	4.89	6.12	9.24	9.16	4.3
54	38M	18.2	4.00	9.48	9.83	11.43	3.7	16.3	4.08	7.56	8.50	10.16	3.6
66	34F	15.0	3.53	6.96	9.20	9.97	4.1	15.0	3.66	6.00	7.98	9.41	3.8
74	41F	15.4	3.19	7.62	10.43	10.42	4.4	17.0	3.25	5.40	8.92	9.17	4.5
64	44F	16.0	3.97	5.70	10.15	9.16	5.0	19.6	4.08	4.50	8.30	8.47	4.6
61	55F	19.2	3.84	6.96	10.20	9.86	4.5	15.1	3.63	5.28	8.55	9.01	4.3
29	44F	20.5	3.25	7.86	10.30	10.54	4.3	18.8	3.54	5.58	8.90	9.20	4.4
12	29F	19.6	4.50	6.90	10.03	9.69	4.5	20.6	4.74	5.15	9.08	8.66	4.7
18	41F	19.8	4.08	7.32	10.40	10.03	4.5	16.1	4.49	6.47	9.64	9.45	4.4
43	35F	17.8	4.75	6.46	10.00	9.38	4.6	16.3	4.81	5.25	8.50	8.69	4.3
49	45F	17.3	5.00	5.64	10.20	8.86	5.2	19.2	5.25	4.62	9.20	8.23	5.1
60	43F	16.9	4.13	8.40	9.00	10.62	3.5	15.8	4.19	7.11	8.23	9.88	3.6
67	35F	13.7	3.33	7.02	9.65	10.05	4.2	13.4	3.47	6.06	8.40	9.48	4.0
7	56F	19.8	4.35	7.65	10.42	10.14	4.4	17.8	4.55	6.40	8.93	9.40	4.1
50	41F	16.6	3.31	6.12	8.45	9.56	4.0	20.8	3.44	4.98	7.80	8.89	4.1
51	51F	15.3	3.06	7.08	9.93	10.16	4.3	12.0	3.21	5.40	8.55	9.18	4.3
37	57F	17.2	4.50	6.48	9.90	9.45	4.5	...	4.38	4.80	8.35	8.55	4.4
36	24F	17.5	3.93	6.69	9.25	9.72	4.2	17.9	4.38	6.24	8.65	9.35	4.0
33	53F	19.5	3.50	7.80	8.86	10.44	3.6	18.2	3.25	5.82	7.45	9.41	3.6
28	63M	20.0	3.36	6.06	9.49	9.51	4.5	23.2	3.40	4.17	8.26	8.45	4.7
22	74F	18.5	3.20	6.90	10.15	10.02	4.5	15.2	3.45	5.22	9.30	9.02	4.8
71	50F	16.5	3.44	6.60	9.80	9.79	4.5	13.6	3.69	5.28	8.22	8.99	4.2
44.5		17.6 (±0.279)	3.86	7.09 (±0.205)	9.81	9.96	4.32	17.2 (±0.41)	3.99	5.52	8.59 (±0.085)	9.10	4.26

given in most cases. After two days on the diet, to establish a balance, urine was collected for two periods of 48 hours each. A second fasting blood was taken on the seventh morning, to see how the diet affected the blood calcium. Calcium excretion was determined in the urine samples by the McCrudden⁷ method in duplicate. Phosphorus was determined in duplicate by the application of the Benedict-Theis method⁸ to a suitably diluted sample of urine. Calcium intake was calculated from the amount of food eaten when a complete diet was not taken.

are found at the bottom of each column, and probable errors are given in parentheses below these figures. This group of cases comprises two normals, cases number 17 and 54, and various hospitalized cases: uterine fibroids (66, 74, 64, 61, 29), hyperplasia of the endometrium (12, 18, 43, 49, 60, 67), ovarian cyst (7, 50), cholecystitis (51), aneurysm (37), pelvic abscess (36), rectocele (33), benign prostatic hypertrophy (28), uterine prolapse (22) and urethral fistula (71). Since these cases are not chosen normal cases they should be a better control series than those most workers use

Most of them were run as possible cancer patients. Diagnostically, the results proved to be of no value.

The range of values for serum are: K, 13.7 to 20.5 mg.; P, 3.19 to 5.00 mg.; protein, 5.64 to 9.48 g.; calcium (determined), 8.45 to 10.43 mg.; calcium (calculated), 8.86 to 11.43 mg.; and calcium ions, 3.5 to 5.2 mg. For blister fluid they are: K, 13.4 to 23.2 mg.; P, 3.21 to 5.25 mg.; protein, 4.17 to 7.56 g.; calcium (de-

termined), 7.45 to 9.64 mg.; calcium (calculated), 8.18 to 10.16 mg.; and calcium ions, 3.6 to 5.1 mg. It will be seen that in some instances these values are beyond the usually accepted normal limits, but they are representative of hospitalized cases of non-malignant disease which showed no nitrogen retention or clinical evidence of disturbed calcium metabolism.

Table II gives the results on serum and blister fluid of 50 cases of malignancy proved

TABLE II.
RESULTS IN CANCEROUS CASES

Case	Age Sex	Serum						Blister Fluid					
		K	P	Prot.	Ca	Ca (calc.)	Ca++	K	P	Prot.	Ca	Ca (calc.)	Ca++
24	64F	17.0	4.00	6.30	9.80	9.48	4.5	14.8	3.92	5.25	7.99	8.92	4.1
23	54M	14.5	4.19	6.75	10.04	9.68	4.5	16.4	4.19	5.22	7.96	8.83	4.1
79	52M	....	5.18	4.92	9.20	8.41	4.9	....	5.47	3.33	8.20	7.46	5.2
81	48M	17.0	2.15	5.49	10.09	9.50	5.2	16.3	2.14	4.20	7.37	8.79	4.2
62	70M	19.8	3.56	5.67	9.78	9.25	4.8	....	3.78	4.02	7.70	8.27	4.5
80	53M	17.0	4.00	6.00	9.93	9.32	4.8	16.3	3.88	4.59	8.89	8.56	4.9
82	53M	16.3	2.66	5.37	10.19	9.30	5.3	16.2	2.55	3.96	8.50	8.55	5.0
70	56M	....	2.75	6.54	10.50	9.94	4.8	....	2.78	4.80	8.70	8.96	4.7
47	68F	16.5	4.47	5.28	8.70	8.80	4.5	....	4.53	3.87	7.40	8.00	4.3
48	53M	18.6	4.62	5.58	8.98	8.92	4.5	17.0	4.44	4.35	7.80	8.29	4.4
30	46M	15.3	4.16	5.52	10.25	9.01	5.2	....	4.04	4.83	8.39	8.66	4.5
63	47M	20.1	3.49	4.89	9.68	8.83	5.2	....	3.81	3.87	8.15	8.18	4.6
40	81M	16.2	3.03	5.28	9.76	9.16	5.1	....	2.75	4.53	8.40	8.82	4.7
38	30F	16.4	4.09	6.42	9.48	9.53	4.4	20.8	4.50	5.10	8.38	8.69	4.4
21	35F	13.2	2.50	5.19	9.01	9.25	4.7	12.7	3.15	4.02	8.40	8.43	4.9
39	42F	15.3	4.56	6.96	10.00	9.71	4.4	15.3	4.50	5.52	8.60	8.92	4.3
77	40F	16.0	3.85	6.03	9.30	9.37	4.5	14.3	3.58	4.62	8.30	8.65	4.5
26	55F	16.9	4.42	5.61	8.65	8.99	4.3	13.6	4.80	3.90	7.56	7.94	4.4
34	44F	18.0	3.69	5.73	10.40	9.24	5.2	19.1	3.88	4.08	9.32	8.28	4.8
58	63F	23.0	5.16	5.88	9.33	8.95	4.5	....	4.74	4.32	8.00	8.20	4.5
41	52F	19.4	3.98	5.04	9.60	8.79	5.0	15.2	4.04	3.78	8.57	8.07	5.1
56	52F	17.6	4.30	5.25	8.50	8.82	4.4	17.0	4.33	4.59	7.28	8.45	4.0
19	65F	15.6	3.19	6.12	10.72	9.59	5.2	....	3.78	5.04	10.05	8.84	5.3
9	47F	15.9	3.50	7.50	8.88	10.28	3.7	12.0	4.14	5.59	7.78	9.05	3.8
8	37F	16.8	3.80	7.95	9.82	10.45	4.0	13.4	3.99	5.22	8.27	8.88	4.2
46	64F	16.0	4.00	6.99	10.00	9.87	4.4	15.5	4.38	5.64	8.70	9.02	4.3
53	56F	16.7	3.33	7.20	10.73	10.15	4.7	19.0	3.56	5.43	9.11	9.11	4.6
55	52F	17.6	4.27	7.32	9.15	9.98	3.9	16.6	4.25	5.64	7.55	9.05	3.7
59	67F	18.8	4.03	8.04	9.78	10.44	4.0	....	4.19	6.00	7.34	9.27	3.4
72	49F	16.3	2.21	7.44	10.50	10.58	4.5	14.9	2.51	6.30	9.03	9.86	4.2
20	52F	17.7	4.88	6.18	10.47	9.19	5.0	....	4.14	4.42	7.83	8.40	4.3
10	34F	19.7	3.46	5.40	8.19	9.12	4.1	18.4	3.89	4.00	8.16	8.23	4.8
15	47F	16.4	3.02	6.87	9.46	10.05	4.3	13.4	3.58	6.18	7.73	9.52	3.6
27	59F	17.7	4.03	6.54	9.80	9.61	4.5	17.1	4.06	5.01	7.56	8.75	3.9
31	30F	20.1	3.84	6.15	9.21	9.44	4.4	19.8	3.59	4.47	7.75	8.57	4.3
32	51F	13.1	4.02	8.16	9.50	10.51	3.8	12.1	4.09	6.48	8.23	9.56	3.8
35	59F	19.7	4.38	5.52	10.40	8.95	5.3	17.9	4.65	3.81	8.86	7.92	5.3
42	54F	18.2	4.88	4.80	10.20	8.43	5.5	16.6	4.13	3.42	8.30	7.85	5.2
44	44F	16.6	4.38	5.70	9.70	9.05	4.8	16.8	4.44	4.47	8.15	8.35	4.5
45	61F	16.5	3.63	4.83	9.37	8.76	5.0	17.6	3.44	3.84	8.39	8.26	4.9
52	52F	17.4	3.50	6.06	9.70	9.37	4.7	15.5	3.61	4.62	8.59	8.65	4.7
57	54F	18.9	3.72	8.73	9.83	10.90	3.8	17.6	4.06	6.60	8.68	9.67	3.9
65	48F	13.8	2.25	5.10	9.05	9.26	4.3	15.4	2.66	3.84	7.90	8.46	4.7
68	47F	15.4	3.91	5.46	8.98	9.03	4.5	15.7	4.16	4.68	6.98	8.53	3.8
69	27F	19.9	3.88	6.24	11.68	9.48	5.6	15.2	4.05	4.59	9.55	8.52	5.2
73	56F	....	3.49	5.82	9.10	9.34	4.5	....	3.59	4.48	8.00	8.48	4.4
75	49F	16.5	3.61	8.52	11.39	11.18	4.5	13.9	4.06	6.09	9.83	9.35	4.7
76	50F	18.8	3.72	7.26	10.68	10.09	4.7	15.2	3.88	6.24	8.98	9.48	4.2
78	47F	15.2	3.34	5.90	8.88	9.43	4.3	14.4	3.22	4.89	7.80	8.90	4.1
83	52F	....	3.72	6.84	10.50	9.85	4.7	....	4.12	5.88	8.20	9.27	4.0
	51.3	17.2 (±0.189)	3.78	6.21 (±0.098)	9.94	9.49	4.63	15.9 (±0.23)	3.88	4.79	8.26 (±0.060)	8.67	4.44

in all but one case by tissue examination, and in that one by x-ray films after a barium meal. It was not possible to run potassium in all cases because of insufficient material.

Cases in Table II were diagnosed as follows: non-keratinizing epithelioma of the nose (24), carcinoma of the lip (23), malignant lymphoma (79, 81), carcinoma of the stomach (62, 80, 82, 70, 47), carcinoma of the bladder (48), carcinoma of the œsophagus (30), carcinoma of a bronchus (63), carcinoma of the rectum (38, 40), carcinoma of the large bowel (21, 39), carcinoma of the omentum (77, 26), carcinoma of the ovary (34, 58, 41), carcinoma of the vagina (56), carcinoma of the fundus uteri (19, 9, 8, 46, 53, 55, 59, 72), and carcinoma of the cervix uteri (20, 10, 15, 27, 31, 32, 35, 42, 44, 45, 52, 57, 65, 69, 73, 75, 76, 78, 83).

calcium values are not significantly different. The average calcium of the blister fluid, however, is less in the cancerous group. This is in agreement with previous work.² In the cancer group the blood calcium exceeds the calculated value in 62 per cent of the cases, which shows that for serum this group has more calcium than the non-cancer group, and would indicate an excess rather than a deficiency of calcium. McLean and Hastings¹¹ have found that calcium ions are below the normal range of 4.25 to 5.25 only in hypoparathyroidism and with N-retention. Five cancerous and five non-cancerous cases are below this range. Cases with N-retention have been excluded from these groups and urea N determinations on over 90 per cent of the cases fall in the range of 6 to 15 mg. per 100 c.c. of blood. Blister fluid calciums vary

TABLE III.
SUMMARY OF RESULTS ON SERUM AND BLISTER FLUID

	Cancerous			Non-Cancerous		
	Maximum	Minimum	Average	Maximum	Minimum	Average
<i>Serum</i>						
K.....	23.0	13.1	17.2 \pm 0.189	20.5	13.7	17.6 \pm 0.279
P.....	5.18	2.15	3.78	5.00	3.19	3.86
Protein.....	8.73	4.80	6.21 \pm 0.098	9.48	5.64	7.09 \pm 0.205
Ca.....	11.68	8.19	9.94	10.43	8.45	9.81
Ca (calc.)....	11.18	8.41	9.49	11.43	8.86	9.96
Ca++.....	5.5	3.7	4.63	5.2	3.5	4.32
<i>Blister Fluid</i>						
K.....	20.8	12.0	15.9 \pm 0.227	23.2	13.4	17.2 \pm 0.410
P.....	5.47	2.14	3.88	5.25	3.21	3.99
Protein.....	6.60	3.33	4.79 \pm 0.081	7.56	4.17	5.52 \pm 0.129
Ca.....	10.05	6.98	8.26 \pm 0.060	9.64	7.45	8.59 \pm 0.085
Ca (calc.)....	9.86	7.46	8.68	10.16	8.18	9.10
Ca++.....	5.3	3.4	4.4	5.1	3.6	4.26

In this group of malignant cases the ranges of values are for serum: K, 13.1 to 23.0 mg.; P, 2.15 to 5.18 mg.; protein, 4.80 to 8.73 g.; Ca (determined), 8.19 to 11.68 mg.; Ca (calculated), 8.41 to 11.18 mg.; and calcium ions, 3.7 to 5.5 mg. The ranges of values for blister fluid are: K, 12.0 to 20.8 mg.; P, 2.14 to 5.47 mg.; protein, 3.33 to 6.60 g.; Ca (determined), 6.98 to 10.05 mg.; Ca (calculated), 7.46 to 9.86 mg.; and calcium ions, 3.4 to 5.3 mg.

Table III summarizes the values for serum and blister fluid. In spite of a difference of almost six years in the average ages of the cancerous and non-cancerous groups the serum

from the calculated values by about the same amount in the two groups. The fact that average calcium ion concentrations are higher in both blood and blister fluid of the cancer group seems to show that they have no parathyroid deficiency, or less than the group we have chosen as controls. Shear¹ has summarized the work previously done on diffusible calcium. Our work on calcium ions seems to bear out the work already done, showing no significant changes in diffusible calcium in cancer. The explanation for the apparent low calcium in blister fluid in cancer is found in lower protein values and slightly higher in-

organic phosphate values. A careful check was made on the histories of all cases. The average duration of symptoms for the cancer group was fifteen months. In this group, 21 cases out of 50 showed more than an occasional trace of albumin in the urine and 11 others gave a history of weight loss. Twenty-seven patients out of the 50 had a history of weight loss, and this was not recorded in 17 others. Thus, more than half of the patients have some malnutrition and cachexia, though none of them were terminal cases, and in 40 per cent of them there was some loss of albumin in the urine.

In the non-cancerous group, 7 of the 22 showed more than an occasional trace of albumin in the urine. Only two gave a history of weight loss, one a case of a large uterine fibroid of long duration, and the other a cystic endocervicitis. The average duration of symptoms in this group was twenty months and there are two normals with no symptoms.

Although, as has been shown before, there is no deficiency of blood calcium directly related to the malignancy, and although, as it appears from these results, the deficiency of blister fluid

calcium is dependent on the cachexia and decreased protein content in cancer, there is still no proof that the body cells of cancerous cases are not deficient in electrolytes. We are, at present, working on tissue analysis in an attempt to prove this. There is some evidence in the literature to show that radiation is more effective¹² and that tumours may even regress¹ if the calcium content of the tissue can be increased.

In Table IV are given the results of our calcium excretion studies. There seemed to be no difference between excretion of calcium in cancerous and non-cancerous cases, all of which fell in the normal range. This work required a great deal of work by the dietitian (E.E.), and unless complete balance studies could be made we felt further work would be useless. Complete studies were made on two cases on high calcium diet, which showed about the same degree of calcium retention in one cancer and one normal case, but facilities were not available to extend the scope of the study, and we doubted if the results would warrant more work. If urinary calcium can be taken as a

TABLE IV.
CALCIUM BALANCE STUDIES

Case Age	Urine						Blood							
	Calcium			Phosphorus			Before Diet				After Diet			
	In	Out	Balance	In	Out	Balance	Ca	P	Prot.	BUN	Ca	P	Prot.	BUN
<i>Non-Malignant Control Cases</i>														
40A....	0.100	0.451	-0.351	0.258	1.339	-1.081	8.95	3.50	6.64	13	11.40	3.69	7.30	10
41B....	0.400	0.310	0.090	2.004	1.122	0.882	9.70	4.94	5.30	7	12.00	5.90	6.28	8
22D....	0.400	0.401	-0.001	2.004	2.669	-0.665	10.75	4.38	7.68	10	10.80	2.34	7.77	7
31E....	0.351	0.175	0.176	1.926	1.083	0.843	10.05	3.69	6.74	13	10.75	3.13	7.23	13
41H....	0.326	0.728	-0.402	1.333	1.048	0.285	10.80	3.09	6.02	15	10.60	4.27	5.67	13
56J....	0.357	0.113	0.244	1.605	1.464	0.141	10.85	2.55	6.84	8	10.35	4.44	6.42	9
47K....	0.376	0.501	-0.125	1.860	1.354	0.506	10.66	2.96	7.56	11	9.39	1.63	6.90	11
Average	0.330	0.382	-0.053	1.570	1.440	0.130	10.25	3.55	6.68	11	10.76	3.63	6.80	10
<i>Cases of Malignancy</i>														
56C....	0.400	0.397	0.003	2.004	0.764	1.240	9.10	3.49	6.24	15	10.45	4.38	6.12	12
50F....	0.400	0.266	0.134	2.004	1.230	0.774	10.68	3.72	7.26	19	10.40	2.68	7.68	15
40G....	0.307	0.415	-0.108	1.587	1.170	0.417	9.30	3.85	6.03	8	9.88	5.00	6.72	19
47I....	0.364	0.648	-0.284	1.952	1.972	-0.020	8.88	3.34	5.90	9	9.18	2.55	5.67	11
47L....	0.400	0.553	-0.153	2.004	1.889	0.115	10.00	4.03	6.21	16	9.76	2.02	5.73	15
Average	0.374	0.456	-0.082	1.910	1.405	0.505	9.59	3.69	6.33	13	9.93	3.33	6.38	14

(Calcium and phosphorus balances are given in grams per 24 hours, blood Ca, P and B.U.N. in mg. per 100 c.c., and blood protein in g. per 100 c.c. serum.)

measure of calcium excretion in this series, then there is no marked difference in calcium excretion between cancerous and non-cancerous individuals.

CONCLUSIONS

Malignancy may be related to a calcium deficiency in the tissue. This deficiency is not evident in blood serum but appears in the blister fluid of the body.

Any difference in calcium content of cancerous and non-cancerous cases seems to be due to a difference in protein and phosphorus of the fluids, especially protein.

Cancerous individuals show a significantly decreased total protein in blood and blister fluid.

Urinary excretion of calcium in cancerous cases on low-calcium neutral diet is not markedly different from that of non-cancerous cases.

The potassium content of blood serum and blister fluid of malignant persons is not significantly different from that of non-cancerous individuals.

As judged by calcium-ion concentrations cancerous cases have no parathyroid deficiency.

REFERENCES

1. SHEAR, M. J.: The rôle of sodium, potassium, calcium and magnesium in cancer, a review, *Am. J. Cancer*, 1933, 18: 924.
2. PITTS, H. C. AND JOHNSON, H. R.: A comparative study of body fluids in cancerous and non-cancerous individuals, *New Eng. J. Med.*, 1930, 202: 415.
3. LOWENBERG, C. AND MATTICE, M.: Note on the determination of inorganic phosphate of serum and spinal fluid on the supernatant fluid from calcium estimation, *J. Lab. & Clin. Med.*, 1930, 15: 598.
4. DENIS, W. AND AYER, J. B.: A method for the quantitative determination of protein in cerebrospinal fluid, *Arch. Int. Med.*, 1920, 26: 436.
5. JACOBS, H. R. D. AND HOFFMAN, W. S.: A new colorimetric method for the estimation of potassium, *J. Biol. Chem.*, 1931, 93: 685.
6. BAUER, W., ALBRIGHT, F. AND AUB, J. C.: Studies of calcium and phosphorus metabolism. II. The calcium excretion of normal individuals on a low calcium diet; data on a case of pregnancy, *J. Clin. Investigation*, 1929, 7: 75.
7. MCCRUDDEN, F. H.: The determination of calcium in the presence of magnesium and phosphates. The determination of calcium in urine, *J. Biol. Chem.*, 1911-12, 10: 187.
8. BENEDICT, S. R. AND THEIS, R. C.: A modification of the molybdc method for the determinations of inorganic phosphorus in serum, *J. Biol. Chem.*, 1924, 61: 63.
9. CLARK, E. P. AND COLLIP, J. B.: A study of the Tisdall method for the determination of blood serum calcium, with a suggested modification, *J. Biol. Chem.*, 1925, 63: 461.
10. PETERS, J. P. AND EISENBERG, L.: The influence of protein and inorganic phosphorus on serum calcium, *J. Biol. Chem.*, 1929, 84: 156.
11. MCLEAN, F. G. AND HASTINGS, A. B.: Clinical estimation and significance of calcium ion concentrations in the blood, *Am. J. M. Sc.*, 1935, 189: 601.
12. JOHNSTON, W. A.: The effect of x-rays on bacteria in media of high specific gravity, *Radiology*, 1933, 20: 195.

BLOOD LIPIDS IN POLYCYTHÆMIA VERA*

BY ELDON M. BOYD,

Queen's University,

Kingston, Ont.

IN 1932, Patton, Allardyce and McKeown¹ reported in this *Journal* 6 cases of polycythæmia vera, in 4 of which the plasma total cholesterol was above the highest value which they found in 3 normal subjects. Since cholesterol is anti-hæmolytic, they suggested that this high percentage of plasma cholesterol prevented hæmolysis of the red blood cells and gave rise to the polycythæmia. There have been few other reports on blood cholesterol in Vaquez's disease. Epstein and Lande,² in 1922, found the cholesterol of whole blood to be quite low in one case. In the present report are given the results of studies on blood cholesterol in 7 cases, 4 of which were definitely polycythæmia vera, 2 questionably so, and 1 a known secondary

polycythæmia. In addition to total cholesterol, the free and ester fractions were separately estimated, and, since these are closely linked with fat metabolism, the remaining blood lipids, phospholipid and neutral fat, were also determined. Changes in plasma lipids need not be and seldom are identical with those in the red blood cells.³ Hence in most of the cases a complete differential lipid analysis was performed on both plasma and the red blood cells, using the Bloor oxidative micromethods as modified by Boyd.⁴

The lipid content found in blood plasma in these cases is given in Table I. In most cases several analyses were made during the course of treatment of the condition, and a few representative examples of these have also been included in Table I. Patients R.R. and D.D. were bled and patient M.V. received deep x-ray

* This work was aided financially by the Alice F. Richardson Fund of the Kingston General Hospital.

therapy over the long bones. The normal values are those which include approximately two-thirds of healthy individuals as previously found.⁵

It will be seen that the total lipid of plasma varied both above and below the normal range. From cases R.R., M.V. and M.W. it might be concluded that the total lipid varied inversely as the red cell count, but in this particular D.D. was an exception. In the two cases of questionable polycythæmia vera plasma total lipid also

the red cell count. Many of the phospholipid values were inversely related to the percentage of red cells, but in view of the variations encountered it is doubtful if this is significant. Since the concentration of the component lipids was not found to be connected with the percentage of erythrocytes, it is obvious that the apparent relation of plasma total lipid was purely coincidental. Apart from the finding of many low values, these results fail to demonstrate any consistent relation between plasma

TABLE I.
THE LIPID COMPOSITION OF BLOOD PLASMA IN POLYCYTHÆMIA. THE RESULTS ARE EXPRESSED IN MG. PER 100 C.C. OF PLASMA.*

Case	Red Cell Count	Diagnosis	Total Lipid	Neutral Fat	Phospholipid	Cholesterol		
						Total	Ester	Free
Normal			540-690	80-230	160-230	160-200	100-150	40-60
R.R.-1.....	9.75	Poly. vera	240	58	118	54	15	39
R.R.-2.....	6.38	Do. bled	311	43	139	89	59	30
R.R.-3.....	5.80	Do. bled	516	232	158	90	54	36
R.R.-4.....	6.00	Do.	489	153	144	131	91	40
M.V.-1.....	8.62	Poly. vera	495	195	136	119	77	42
M.V.-2.....	8.00	Do. x-ray	470	153	144	119	81	38
M.W.-1.....	5.1	Poly. vera	731	90	269	263	163	100
M.W.-2.....	5.3	Do. later	690	146	206	227	166	61
D.D.-1.....	8.17	Poly. vera	455	...	...	212	...	...
D.D.-2.....	7.6	Do. bled	388	...	...	176	...	...
D.D.-3.....	5.8	Do. bled	356	...	...	160	...	...
D.D.-4.....	6.2	Do. later	442	...	...	220	...	...
B.B.....	5.8	?Poly. vera	657	238	206	160	79	81
S.W.....	7.0	?Poly. vera	263	...	...	208	...	...
W.L.....	9.0	Sec. Poly.	1103	230	374	339	239	100

* Since completing this work, two additional cases of polycythæmia vera have been studied; the lipids of both plasma and the red blood cells were within the normal range in both cases.

varied inversely as the red cell count. Case W.L. was one of acute post-operative pulmonary œdema in which a polycythæmia and lipæmia arose from diffusion of the fluid and non-colloidal elements of blood into the lungs and other tissues of the body. From these results it would appear that when the red cell count is high in polycythæmia vera, the plasma total lipid is low, and, *vice versa*, when the red cell count is low the plasma total lipid is high. This relationship is relative and not absolute, since most of the values tended to be in the low range of normals. However, there was very little evidence that any of the component lipids varied inversely with the red cell count. Both in the treated and untreated cases there were more values below the normal range than above it. Neither neutral fat nor any of the cholesterol fractions could be said to vary at all with

lipids and polycythæmia vera. The total lipid content of the red blood cells in these cases varied between 489 and 693 mg. per cent. There were but traces of neutral fat and ester cholesterol; phospholipid varied between 271 and 521 mg. per cent, and free cholesterol between 110 and 167 mg. per cent. Neither in the treated nor in the untreated cases was there any change which could be called significantly different from normal.

These results fail to prove any disturbance in the concentration of blood lipids in polycythæmia vera. Taken in conjunction with the previous contradictory findings of Patton, Al-lardyce and McKeown,¹ on the one hand, and Epstein and Lande,² on the other, they indicate that if there is any change in lipid metabolism in this condition it cannot be demonstrated in this manner.

Part of this work was done at the Strong Memorial Hospital, Rochester, N.Y. The author wishes to thank Miss Marvel-Dare Fellows and Dr. D. J. Stephens for their assistance.

REFERENCES

1. PATTON, W. D., ALLARDYCE, J. AND McKEOWN, T.: Is polycythemia vera the antithesis of pernicious anemia? *Canad. M. Ass. J.*, 1932, 27: 502.
2. EPSTEIN, A. A. AND LANDE, H.: Studies on blood lipids. I. The relation of cholesterol and protein deficiency to basal metabolism, *Arch. Int. Med.*, 1922, 30: 563.
3. BOYD, E. M.: The lipopenia of fever, *Canad. M. Ass. J.*, 1935, 32: 500.
4. BOYD, E. M.: A differential lipid analysis of blood plasma in normal young women by micro-oxidative methods, *J. Biol. Chem.*, 1933, 101: 323.
5. BOYD, E. M.: The lipemia of pregnancy, *J. Clin. Invest.*, 1934, 13: 347.

MORTALITY IN SURGERY OF THE GALLBLADDER*

By WILLIAM OLIVER STEVENSON, M.B., F.R.C.S.(E.), F.R.C.S.(C.),

Hamilton, Ont.

IN any discussion on the subject of mortality in gallbladder disease a simple classification would help to make clear some of the points in the following paper. Deaths following operation upon the biliary tract fall into three classes.—

1. Those due to definite and distinct complications, such as hæmorrhage, shock, infection, pulmonary, cardiac, and other surgical complications as biliary fistula, lesser sac infections, etc. About nine-tenths of the deaths belong to this class.

2. The so-called hepatic insufficiency group, beginning about the sixth day with the symptoms of rising temperature and pulse, abdominal distension, nausea, vomiting, and an increasing flow of urine, containing albumin and casts, followed by delirium and coma, jaundice and death.

3. The high temperature group with the following symptoms. Soon after operation the temperature begins to rise, 102° up to 105°, even to 109°, followed later by a rise in pulse, respiration, vomiting, not much pain, distension, jaundice, sometimes a stage of excitement followed by lethargy, coma and death within forty-eight hours.

The second and third in these groups are known at present, for want of a better name, and because their causes are unknown, as "liver deaths". They account for about one-tenth of the total mortality.

Gallbladder surgery is attended with a definite mortality which varies between 3 and 6 per cent. On this both American and British writers are agreed. Whether the gallbladder is removed or only drained apparently makes

no difference. The mortality in the more severe operation of cholecystectomy seems to be balanced by the poorer general condition of the patients upon whom only a cholecystostomy is possible. Cholecystectomy still remains the operation of choice. Cholecystostomy is considered in cases of extreme mechanical difficulty, very poor general condition, advanced age, massive adhesions in acute septic cases, purulent cholangitis, and organic obstruction of the common duct by diseases of the duct, the head of the pancreas or the ampulla of Vater. The subject of mortality may be divided into that of acute gallbladder disease and that of chronic gallbladder disease.

Acute cholecystitis is much commoner than cholangitis because of the readier drainage of the ducts into the bowel. The great majority of the cases of acute cholecystitis are associated with gall-stones. The different varieties of cholecystitis, acute catarrhal, acute suppurative, phlegmonous, and gangrenous, are really stages in the ordinary processes of inflammation. The attack may be mild and the inflammation abort; it may be severe and cause ulceration and perforation or thrombosis and gangrene. The bile is peculiarly resistant to the *S. hæmolyticus*. The organisms usually found are the *B. coli*, staphylococcus, *B. Welchii*, and *S. viridans*. These various infective organisms reach the gallbladder by way of the blood stream or by retrograde lymphatic flow.

The gallbladder may be compared to the appendix in that it is an end organ, served by one duct, one artery and its own chain of lymphatics. It has, however, differences in its larger capacity of the lumen and the elasticity of its wall. These two factors enable the organ to withstand inflammation to a greater degree

* Read before the Staff Conference of the Hamilton General Hospital, Hamilton, November 25, 1935.

and for a longer time than the appendix. There is more room for the products of inflammation. While the wall is being gradually stretched by the inflammatory process the omentum has more time to form protective adhesions. Moreover, its duct is of larger size. The obstructing agent, usually a stone, behind which the inflammation is set up, is movable. This stone may be slowly passed or it may drop back into the lumen of the gallbladder. The common obstructing agent in an appendicitis is a fixed constriction of scar tissue, closing the lumen, which holds back the virulent toxic material with or without a faecolith. Clinically, therefore, cases of acute cholecystitis pursue a slower course than those of acute appendicitis. Acute biliary colic is associated with little or no rise of temperature. The majority of cases will subside after the pain has passed off and show no clinical signs of acute inflammation or obstruction of the ducts. If, however, the pain persists in the upper right quadrant, with the development of temperature, increasing tenderness and a rising leukocyte count, the case, in all probability, is developing into one of acute cholecystitis. There are variations in this picture, especially in the elderly, in whom the clinical symptoms are not proportionate to the extent of the lesion present. The temperature is perhaps the surest guide to the virulence of the cholecystitis. A temperature of 101° would indicate, roughly, a very acute cystitis, while a temperature of 103° would indicate empyema or gangrene. Conversely, the best index of subsidence is the return of the temperature to normal and a decrease in the amount of pain and tenderness.

Perforation, fortunately, is not common. When it occurs it seldom gives rise to the severe general symptoms that perforation of the appendix does, because the gallbladder has had time to be walled off. Some perforations are small and take place through the unperitonized wall of the gallbladder into the gallbladder bed. Perforations into the general peritoneal cavity are attended, on the other hand, with great pain, for bile is a great irritant. They are to be suspected in cases showing the high temperature of a gangrenous gallbladder in which the extreme rigidity and tenderness have suddenly become more severe. The association of mild jaundice and chills

with this picture of acute cholecystitis would indicate the serious complication of infection involving the biliary duct system, either extra-hepatic or intra-hepatic or both. Stone in the common duct, fortunately, is not very common in cases of acute cholecystitis. Sometimes, however, the clinical history suggests the presence of a stone in the common duct. It is well to remember also that 25 per cent of cases of common duct stones are never attended with jaundice.

The mortality of acute cholecystitis is due to general peritonitis in 33 per cent of the cases, broncho-pneumonia in 20 per cent of the cases, and myocardial degeneration in another 20 per cent. The large proportion of deaths caused by peritonitis would lead us to believe that the walling-off process in diseases of the gallbladder is not so efficient as we thought, or the poisonous focus was allowed to remain long enough for the infection to spread through the walls of the gallbladder and the adhesions to infect the peritoneum of the vulnerable upper abdomen. The very free interchange of the lymphatic flow through the diaphragm may account for the high incidence of broncho-pneumonia.

At the present time there is considerable controversy as to more early operation in cases of acute cholecystitis. We all realize the fact that the safe time to operate on an appendix is early in the attack. With few exceptions an attack of cholecystitis comes on more slowly than one of appendicitis, and the urgency for operating is therefore not so great. It is not always realized that acute cholecystitis is a surgical and not a medical disease. This may account for the fact that the surgeon does not see cases until the third, fourth, or fifth day. Until it is recognized that an acute inflammation of the gallbladder is an exceedingly dangerous condition there will be a corresponding amount of avoidable mortality.

The question arises, how then should these cases be treated? The vast majority of cases, being associated with stone, will begin with biliary colic. There may or may not have been previous attacks. Most of these cases, as everyone knows, will subside with the cessation of the colic. A certain number, however, do not, and in the course of eight to ten hours will present the clinical picture of localized tender-

ness and an increase of temperature. If this condition progresses, it must be realized that the patient has an increasing infection in the gallbladder which may go on to empyema, gangrene or perforation. The presence of a tense gallbladder tumour and a temperature about 103° would indicate that this dangerous state had been reached. Sometimes it is possible to feel the tenseness of the gallbladder, even through a thick fatty wall. By experience with these cases, it is usually possible to recognize gangrene and impending perforation. The degree of tenseness and the amount of tenderness are the important indicators. This serious state may take as long as a week to develop. There is, however, no reason why these cases should be allowed to reach this stage. A temperature of about 101° in an attack of three to five days' duration would indicate that the inflammation will probably progress, with the production of an empyema or gangrene. The writer is of the opinion that these cases should not be allowed to pass this stage without operative interference. While under observation, the condition of the heart, lungs, and kidneys can be checked and the whole case assessed. Appropriate treatment by rest, heat, glucose intravenously, and urotropin can be carried out at the same time and a large number in this group will improve greatly. Improvement will be shown in the temperature and tenderness, and they can then be operated upon more safely in the descending phase of the attack.

The operation should be a cholecystectomy unless the conditions permit only a simple cholecystostomy. The common duct, as a rule, should not be opened during an operation for acute cholecystitis; it is usually inaccessible. The inflammation of the gallbladder is so intense that an exploration of the common duct is a hazardous procedure. If the stone in the duct can be felt and removed quickly by a choledochotomy this may be attempted. The very severe cases will have to be operated upon without unnecessary delay. They should be fortified in every possible way, the operation speedily done and, if necessary, only a cholecystostomy performed. It is in this small group of cases of advanced acute cholecystitis that the mortality is highest. It is a matter of common experience that convalescence in cases operated upon before gangrene and suppuration

have set in is surprisingly smooth after the removal of the focus of infection. Statistics have shown that the complications of bronchopneumonia and myocardial failure have been materially reduced.

Surgery of the chronic gallbladder is performed under entirely different conditions from that of the acute gallbladder. The patient is usually in fair condition. There has been time for a good physical examination. Infection, if present at all, is quiescent and the patient most likely immune to it. About 80 per cent of all the surgery performed on the gallbladder can be placed in this chronic class. About 25 per cent of these cases will be those of chronic cholecystitis only, and the remainder will be associated with stone. The common symptoms are well known to be those of the characteristic indigestion, consisting of flatulence, inability to digest fats and periodic distress in the region of the gallbladder. Superimposed on these may be gall-stone colic and pain referred to the right side of the back and the right shoulder blade. There is one sign, however, that of the muddy complexion which has not received the attention that it deserves. It is consistently present in chronic gallbladder disease. Even in the early case and in the young patient there is this peculiar sallowness which is quite characteristic. There is usually no pink in these complexions, and in the presence of a pink complexion one should hesitate to diagnose gallbladder disease. The x-ray, of course, can be used to check the clinical diagnosis and it will be of service in the doubtful case.

In regard to the pathological process present in these chronic cases the gallbladder presents a wide variety of pictures. These pictures will vary according to the previous disease. The colour of the gallbladder will be changed from its normal blue-grey colour. The gallbladder may be hidden either partially or completely by adhesions, which may be soft and recent, or may be very sclerosed, in the case of long-standing disease. The gallbladder itself may be adherent to the duodenum. It is subject to many contractures. Sometimes it is nothing but a little tight sac enclosing two or three stones situated deeply in the abdomen. In many cases it is about half normal size, with its walls somewhat thickened and a dark bluish-brown colour. Sometimes contracture takes place somewhere in

the length of the gallbladder, producing an hour-glass constriction. The thickness of the wall will vary. Sometimes it is exceedingly thin, and this is the type of gallbladder which is apt to have cholesterol deposits in the mucosa, giving rise to the designation "strawberry gallbladder". There is also the gallbladder with a wall about one-eighth inch thick, which is sclerosed and is commonly found filled with stones. This type is the one which is apt to turn malignant. When there is a stenosis of the cystic duct, the gallbladder may form a mucocele filled with so-called "white bile".

The gallbladder can also give rise to symptoms due to the freedom of its attachment to the liver. This allows torsion to take place. One case of this nature was operated on recently. The x-ray showed a long pendulous gallbladder shadow extending downwards in line with the transverse lumbar processes. The relief obtained by cholecystectomy confirmed the diagnosis that this patient was having slight attacks of acute torsion at the neck of the gallbladder.

It is possible, as a rule, to palpate stones in the gallbladder through its walls. A certain percentage, however, cannot be palpated, and it would be unwise to say that no stones were present without opening the gallbladder. The common duct lies in a free border of peritoneum in front of the foramen of Winslow, in close association to the hepatic artery and the portal vein. It is possible in most of these chronic cases to put one finger in the foramen and palpate the ducts upwards to the hilum and downwards to the head of the pancreas. Intraductal pancreatic stones are difficult to feel. A stone in the ampulla can best be palpated across the empty duodenum. If the peritoneum is incised at the edge of the duodenum it is possible to pass the index finger behind the duodenum and palpate the ampulla between the finger and thumb.

In considering the anatomy of the cystic duct and the cystic artery and its connections about the hilum of the liver, there is perhaps no other small area of the body that has so many abnormalities. It is not within the scope of this paper to list these. It is sufficient to state that the cystic duct may be absent or duplicated and all manner of connections made with the common duct. The common duct may be duplicated. The common hepatic duct may enter one side of the neck of the gallbladder and the common

bile duct leave from the other side. The cystic artery may arise from the right or left hepatic (usually the right), or from the main trunk of the hepatic, or from the superior mesenteric, and it reaches its destination by various routes in any relation to the cystic duct. There is one relation, however, that is very constant and this is the relation of the cystic artery with the neck of the gallbladder. It is commonly posterior in the gallbladder bed. The portal vein is in close association with these structures. It may bifurcate at this point or even lower down. This area is also a very rich lymphatic field and close by is situated the largest collection of sympathetic nerves and ganglia in the abdomen. All these important structures are situated in a very small area. It can readily be understood how dangerous this small area can become when it has superimposed upon it the results of long-standing gallbladder disease.

The causes of mortality in chronic gallbladder disease are obviously different from those in acute disease. The mortality in the acute cases ranges between 12 and 15 per cent; that in chronic cases is about 2 to 3 per cent. Even with the proper appraisal of the general condition and the administration of suitable anaesthesia there will be deaths from myocardial failure and pneumonia, either hypostatic or bronchial in type. A considerable number of deaths can be attributed to damage produced in the small dangerous area referred to above. It is easy to imagine clamp injury to any of these structures in attempting to secure a bleeding vessel in this area. A clamp, even if it has been released, has already produced a crushing injury to the lining membrane of the seized structure. Heavy and deep sponging to expose the cystic duct can be a source of damage.

Injury to the hepatic artery may result in gangrene of its wall with secondary hæmorrhage. It may result in thrombosis, and since this vessel is an end-artery and the sole source of oxygenated blood for the nourishment of the liver cells, these will necessarily be undernourished and the whole function of the liver thereby interfered with. The cells of the liver are peculiar in that they degenerate very quickly, just as they also regenerate very quickly. Cases of so-called "liver deaths", which occur eight to ten days after operation, show the liver cells to be in a state of fatty degeneration coinciding with the picture produced through

lack of oxygenated blood. It is, therefore, justifiable to believe that interference with the hepatic blood supply is a cause of "liver death". Damage to the portal vein may result in secondary hæmorrhage, thrombosis and liver infarction; damage to the biliary ducts may result in secondary biliary fistulas or late constriction and various degrees of biliary obstruction. Infarction and partial obstruction of the biliary system may account for those few cases that have persistence of painful symptoms after operation, referable to the lower right costal area.

Operations on the biliary system are done with two objects in view; first, to remove the diseased gallbladder, the seat of infection and the site of formation of most gall-stones, and, second, to deal with obstructions to the passage of bile. With the removal of the gallbladder, the first object is attained. The second concerns only the hepatic ducts and the common bile duct. The cystic duct is only a tributary in the duct system and is seldom the seat of disease. Even in acute cholecystitis with obstruction this obstruction is nearly always at its entrance into the gallbladder. Occasionally the duct is obstructed by a stone lower down, which may be difficult to remove, but in the great majority of cases it is not diseased or obstructed. It is important to recognize this fact, for it at once obviates the necessity of interfering with the dangerous area where all the abnormalities in form and relationship occur.

In the operation of cholecystectomy it would appear that the important anatomical point is the junction of the gallbladder with the cystic duct. The cystic artery has reached its constant location at this point and can be easily secured. From the foregoing remarks it will be understood that there is no necessity of removing any of the cystic duct. If a clamp is placed on the distal portion of the gallbladder the gallbladder can be resected and leave behind the whole of the cystic duct, to which is attached a small spoon-like process of gallbladder wall corresponding to Hartmann's pouch. The cystic duct can be ligatured at its most distal point. The tag of gallbladder is most useful for the application of clamps for traction in cases of bleeding, and serves as the point of anchorage for the precautionary drain. In this way, it is unnecessary to transgress into

the dangerous area where damage can be so easily done.

A certain number of deaths are caused by prolonged drainage of bile in large quantities from fistulas. Secondary operations are also serious procedures in stout elderly patients. They are not only difficult mechanically but they are unnecessarily prolonged, due to adhesions formed since the first operation. The anatomical relations are difficult to recognize and obscured by troublesome oozing. It is always wise, therefore, in operating on a quiescent gallbladder to make sure that there are no stones in the common duct. A quick mental survey of the whole case, in which past experience will be valuable, will enable one so to conduct the operative procedure as to reduce the necessity for a second operation to a minimum. An overlooked gall-stone can be of serious consequence. Of course, there is no control over the formation of pigment stones in the intrahepatic duct which may later block the common duct. The location and removal of common-duct stones can be facilitated by the following procedure. The clamp on the gallbladder tag will fix the opening of the cystic duct, which can then be dilated and a probe or small stone forceps passed the length of the common duct. Most common-duct stones can be milked upward into the accessible portion of the common duct where a choledochotomy can be done.

The insertion of a "T" drain in a choledochotomy wound occludes the lumen of the common duct and interferes with the free passage of bile down the duct. The extraction of a "T" drain from a choledochotomy wound always leaves a biliary fistula of variable size and duration. The healing process in this wound is uncertain. A long-standing fistula or a cicatrix with stenosis of the duct, necessitating a second operation, may result. A tube drain placed in the dilated cystic duct will overcome these disadvantages and provide as good, if not better, drainage. The choledochotomy wound can then be closed with one or two fine sutures. A cigarette drain is carried down to this wound. By draining the biliary system in this way there is no obstruction whatever in the lumen of the common duct. The drainage is therefore free and the bile is encouraged to traverse its normal passage to the

duodenum. A biliary fistula of the cystic duct with the presence of normal coloured stools rarely occurs.

The combination of deliberateness and gentleness in operating on these delicate cases will go far to minimize damage and to shorten the time of operating and thereby will help to reduce the rate of mortality.

The basis of this paper is a series of 100 operations for gallbladder disease, performed during the past two and a half years at the General Hospital and St. Joseph's Hospital in Hamilton. There have been 21 acute and 79 chronic cases. There were 94 females and 6 males. Their ages ranged from 22 to 73 years. Their weights varied from 80 to 287 pounds. There were in the series 12 cases of stone in the common duct with jaundice or a history of the same, with 8 choledochotomies; 2 cases of suppurative cholangitis with mild jaundice. These last 14 cases were drained through the cystic duct or by cholecystostomy. Four cases were complicated by diabetes. There were 84 cholecystectomies; 16 cholecystostomies, in 3 of which cholecystectomies were subsequently done; 2 cholecyst-duodenostomies, one for a feared stenosis following ulceration at the site of a stone, and one for a formed stricture of the common duct. Skiagrams were taken in about 20 per cent of cases. The average stay

in hospital was sixteen days. There has been no mortality. One patient, thirty years old, died from embolism sixteen days after operation, while sitting in a wheel-chair awaiting the taxi cab to take her home.

SUMMARY

It is suggested that the mortality in acute gallbladder surgery can be reduced by operating at the optimum time, which optimum time can be determined by continuous attention to the clinical signs and symptoms. If this suggestion is carried out it will be found that earlier operation will result. The convalescence will be smooth and comparatively free from complications.

It is suggested that the mortality in chronic gallbladder surgery can be reduced by a simplified technique. This technique recognizes that the cystic duct itself is seldom the seat of disease, and it is unnecessary to transgress the dangerous area about the hilum of the liver. The danger of mechanical injury, with secondary hæmorrhages and fistulas, is thereby obviated.

The matter of drainage is discussed and the use of "T" drains in common-duct surgery is discouraged. The secondary fistulas and duct strictures which follow their use often render second operations necessary. The use of the dilated cystic duct is recommended.

ABDOMINAL COMPRESSION IN PULMONARY TUBERCULOSIS.—B. Gordon discusses the therapeutic value of abdominal compression by means of binders in pulmonary tuberculosis. He attributes certain unfavourable results in the routine treatment of these cases to the traumatizing action of coughing and the deep, inefficient, and uncontrolled excursions of the diaphragm. He reports a series of 129 patients with bilateral fibroid phthisis who wore special abdominal supports for three to eighteen months. They had all been treated at home or in sanatoria for at least six months without improvement; treatment by collapse therapy was either not indicated or had been tried without benefit. The supports were worn day and night, except in cases of advanced malnutrition, when they were removed for short periods. There was usually relief from dyspnoea and difficult expectoration; attacks of paroxysmal tachycardia were controlled in two instances and gastro-intestinal symptoms in nine.

X-ray examinations revealed improvement in the pulmonary lesions of thirty-nine patients, including decrease in size or disappearance of cavities, and the clearing up of associated tissue abnormalities. In three patients the supports were removed as an experiment; increase of cough followed, and in about four weeks the cavities had returned to their previous size. The supports were again applied, and the cavities diminished in about five weeks. The greatest symptomatic relief and lung improvement occurred in patients with well-developed abdomens and the abdominal type of respiration. Unsatisfactory results, such as elevation of the temperature with increased cough and dyspnoea, were noted in cases with acute extensions or soft caseating lesions and marked fibrosis. The mechanism resembles that of bilateral phrenicectomy, with the added advantage that the propelling force of the diaphragm is preserved and aids in expectoration.—*Am. Rev. of Tuberculosis*, December, 1935, p. 686. Abs. in *Brit. M. J.*

A CASE OF PERNICIOUS ANÆMIA WITH URIC ACID DEPOSITS IN THE KIDNEYS

By H. B. BURCHELL, M.D.,

*Department of Pathology, University of Toronto and Toronto General Hospital,
Toronto*

UNDER certain pathological conditions uric acid deposits occur in the kidneys. These deposits may occur in each of two situations, in the lumina of the tubules, or in the interstitial tissue. Deposits in the tubules are frequently seen in the kidneys of the new-born, where they have been known by the descriptive term of "uric acid infarcts". In adults similar deposits are sometimes seen in cases of leukæmia. Deposits in the interstitial tissue are much more rare, exist as urate rather than the free acid, and are surrounded by a granulomatous reaction. This condition, when found, is typical of gout. A number of cases have been reported in which gout was associated with leukæmia. Schultz's¹ case of aleukæmic leukæmia which developed gout showed at autopsy both uric acid deposits in the tubules and urate deposition in the interstitial tissue of the kidney. In the primary type of gout uric acid infarcts do not occur, and it would appear that the interstitial deposits are characteristic of gout, while the deposits in the tubules are a manifestation of an uricæmia. The precipitation of uric acid crystals in the kidneys in pernicious anæmia has not, to our knowledge, been described. The following case is therefore of unusual interest.

G.S., a bailiff, 53 years of age, was under treatment for four years for pernicious anæmia. At first on liver therapy (120 grams of whole liver daily), he improved rapidly until he felt almost as well as ever. Disliking liver, he later began to take ventriculin in inadequate doses and his symptoms gradually returned. By doubling his dosage of ventriculin improvement in his condition again took place. On February 5, 1934, the patient began to suffer from severe abdominal pain, first felt on the right side, later in both flanks and over the whole abdomen. A pernicious type of vomiting set in, and both pain and vomiting persisted until his death on February 16, 1934.

Physical examination revealed only moderate dehydration and a generalized abdominal tenderness without rigidity. Blood pressure was 140/80. The urine was turbid, contained albumin 2-plus, many red and white blood cells, but no casts. Roentgenological examination of the genito-urinary tract showed no evidence of stones. The patient's condition was puzzling, but not alarming. Forty hours after admission to hospital, he suddenly collapsed and died in

about five minutes. No clinical interpretation of the manner of his death could be given.

Necropsy, performed 10 hours after death, showed a middle-aged man, physically well preserved. No lesion was found to account for the sudden death. The brain and spinal cord showed no macroscopic lesions. The pulmonary artery was free from emboli, and the heart presented a relatively normal appearance, with freely patent coronary vessels. The bone marrow of both vertebræ and femur did not differ from normal, except that a few islands of red marrow were scattered through the upper third.

The only remarkable findings were concerned with the kidneys. Externally they were somewhat unusual in appearance and somewhat large, weighing 245 g. and 225 g. The capsules stripped very readily, leaving a moist surface, irregularly scarred, very pale in colour, and flecked with many small yellowish areas and small purpuric hæmorrhages. The cortex was of normal thickness, and the cortical rays and tubules of the pyramids were outlined by prominent yellowish streaks which were gritty to the knife. Many of the calyces were completely plugged with masses of yellowish, gritty, crystalline precipitate which soon dissolved in water. On biochemical analysis the granular material proved to be practically pure uric acid.

Microscopically, the cortex showed a dense lymphocytic infiltration, which, although diffuse, showed patchy areas of much greater intensity. A few fibrosed glomeruli were present beneath the capsule, but for the most part the glomeruli and tubules had a normal appearance. In the medulla many of the collecting tubules were moderately dilated, and in some a crystalline substance was seen. Using Schultz's technique for staining uric acid in tissues, beautifully coloured crystals were found plugging many of the collecting tubules. The first method, a modified Frankel-Best stain, coloured the crystals a bright red; the second, a methylene blue picric acid process, stained the crystals a brilliant green. No uric acid was seen in the interstitial tissue.

Microscopic sections of the remaining organs showed no remarkable features, except that the heart stained by Sudan iii showed fairly numerous, fine fat droplets scattered through the muscle fibres. Sections of the liver showed a moderate lymphocytic infiltration about the portal vein areas. Weigert stains of the spinal cord showed very slight degeneration in the posterior columns. Sections through the fundic portion of the stomach showed marked atrophy of the mucosa, and parietal cells were absent from the remaining glands.

DISCUSSION

In this case, heavy uric acid deposition had occurred in the kidneys of a patient with pernicious anæmia. This finding suggests a disturbance of uric acid metabolism. In seeking a possible explanation for this upset, three factors may be considered: (1) individual peculiarities in uric

acid metabolism; (2) diet; and (3) abnormal hæmopoiesis in pernicious anæmia.

In man the destruction of uric acid occurs slowly, and Folin *et al.*² have shown that the ability to both destroy or excrete it varies independently in different individuals. Uric acid injected intravenously in human beings persists in the blood stream for many hours. These authors have also shown that in a person who excretes uric acid slowly, severe constitutional symptoms, including severe pallor, nausea and weakness, may occur when relatively small doses of uric acid (22 mg. per kilo.) are given intravenously. In animals, they observed the kidneys during intravenous uric acid administration, and noted the immediate tremendous swelling and pallor of the organs.

In addition to the individual variation in purine metabolism, uric acid formation may be greatly increased by giving a high purine diet. A liver diet is well known to be rich in purines, and it is of interest that during the early period of liver therapy Spence³ reported two cases of acute gout occurring as a complication of feeding one pound of whole liver a day. Of even more interest, however, is the work of Krafka⁴ and of Riddle,⁵ who have demonstrated an increased uric acid output in relation to hæmatopoiesis, and relate it to the normoblasts extruding their nuclei. Krafka found uric acid increased as much as two-fold in the urine of animals following the experimental production of anæmia by bleeding or by the administration of phenyldydrazine. Riddle, working directly with cases of pernicious anæmia on liver extract, has demonstrated a constant increase of two to four mg. of uric acid per cent in the blood preceding the peak reticulocyte count. Following the reticulocyte crises there was a continuing increase of uric acid in the urine.

In the present case, if the uric acid deposits

in the tubules of the kidneys had occurred as a result of any combination of the above factors, the acute non-suppurative inflammatory process in the cortex remains unexplained. Schultz states that when uric acid is deposited in the tissues it is deposited as urate crystals due to the alkalinity of the tissue. Surrounding such deposits there is a granulomatous foreign body reaction and such a reaction is completely absent in these kidneys. Dunn and Polson,⁶ in experimentally produced "uric acid nephritis" (large intravenous injections in rabbits), found only necrosis of the distal segments of the tubules, the localization appearing to be determined by the precipitate of uric acid in these portions. While the association of the lymphocytic infiltration in the cortex and the uric acid deposits in the collecting tubules would lead one to believe that both lesions were due to faulty uric acid excretion there is no sound basis for such a belief.

SUMMARY

A case of pernicious anæmia under treatment with ventriculin and liver for four years showed at autopsy a heavy deposition of uric acid crystals in the kidney tubules and an acute non-suppurative interstitial inflammatory process. Evidence of the possible relationship to excessive hæmopoiesis, diet and individual susceptibility is briefly mentioned.

The case was from the service of Dr. E. S. Ryerson, Toronto General Hospital. Dr. R. F. Farquharson kindly supplied the clinical details and Prof. Oskar Klotz made possible the report by his kindly help and advice.

REFERENCES

1. SCHULTZ, A.: Zur Frage der Beziehungen zwischen Leukämie und Gicht, *Virchow's Arch.*, 1931, **280**: 519.
2. FOLIN, O., BERGLUND, H. AND DERICK, C.: The uric acid problem, *J. Biol. Chem.*, 1924, **60**: 361.
3. SPENCE, J. C. AND LIVER, P. A.: Liver and pernicious anæmia, *Newcastle Med. J.*, 1928, **8**: 71.
4. KRAFKA, J.: Endogenous uric acid and hæmatopoiesis, *J. Biol. Chem.*, 1928, **83**: 409; *ibid.*, 1930, **86**: 223.
5. RIDDLE, M. C.: Endogenous uric acid metabolism, *J. Clin. Invest.*, 1929, **8**: 69.
6. DUNN, J. S. AND POLSON, C. J.: Experimental uric acid nephritis, *J. Path. & Bact.*, 1926, **29**: 349.

ACUTE FATAL CORONARY INSUFFICIENCY.—R. L. Levy and H. G. Bruenn assert that there is a group of patients with atherosclerosis of the coronary arteries to whom death comes suddenly and in whose coronary vessels, at necropsy, no fresh thrombus is found. The syndrome may be designated "acute, fatal coronary insufficiency". The clinical and pathological features of twenty-four cases falling into this category have been studied. Records of 352 other cases of coronary sclerosis, with and without thrombosis, have been similarly studied and used as a background for comparison. In approximately 12 per cent of the fatal cases of coronary sclerosis without thrombosis, death occurred suddenly. If thrombosis

had occurred, death was sudden in 33 per cent. The presence of thrombosis thus almost tripled the likelihood of sudden death. But thrombosis of a coronary artery was rarely if ever the immediate cause of death in these patients. It increased the liability to acute coronary insufficiency by further reducing the functional capacity of an already impaired coronary system. Non-fatal attacks of various sorts in patients with coronary sclerosis may be regarded clinically as intermediate between the ordinary bout of anginal pain or its equivalent and a fatal seizure. It is probable that many of these attacks are due to minor degrees of acute coronary insufficiency without occlusion.—*J. Am. M. Ass.*, 1936, **106**: 1080.

A CASE OF ANEURYSM OF THE AORTA, WITH RUPTURE AND HÆMORRHAGE INTO THE MEDIASTINUM AND PARTIAL DISSECTION OF THE LEFT PARIETAL PLEURA*

BY S. R. TOWNSEND, B.A., M.D.,

Montreal

THE following case appears to illustrate one of the rarer causes of death in aneurysm of the aorta. It is also of interest from the fact that the hæmorrhage undoubtedly developed under clinical observation during the last four days of the patient's life. The main details are as follows:—

J.R., aged 65, was admitted to our wards on May 8, 1935, on the service of Dr. C. C. Birchard. He complained of pain in the left chest, cough, the loss of thirty pounds in weight over a period of eight months, and some feeling of weakness.

Personal history.—The patient was born in Montreal and always enjoyed good health. He had worked as a labourer, but had to stop work in the autumn of 1934, owing to the above complaints. He was a heavy smoker and used alcohol in moderation. He recalled nothing of interest prior to the onset of his present illness, except that he had gonorrhœa twenty-five years previously, followed by an inguinal bubo. He also had a chancre at that time.

Family history.—Irrelevant.

Present illness.—The patient dated the onset of the illness, indefinitely, to the autumn of 1934, but prior to this he had noticed short periods of hoarseness. These periods lasted only a few minutes at a time and he paid no attention to them. He continued at work. In the autumn he developed a hard, dry, unproductive cough, but about a month later began to expectorate phlegm, which was clear and viscid. He never noticed any gross hæmoptysis or blood-streaked sputum.

About the same time he began to have transitory pains in his left chest. These were severe in character and steady, lasting from three to four minutes, and occurring three to four times a day. There was no radiation to the arms but they did radiate to the left side of the neck. For two weeks prior to his admission the pain had been constantly present, interfering greatly with sleep. Over an interval of eight months, approximately, the patient had noticed shortness of breath, especially on exertion. Pollakiuria had also been a feature. During the course of his illness he had a gradual and progressive loss of weight (about 30 lbs.). On account of the persistent and severe pain his family physician advised admission to hospital.

Physical examination.—His nutrition was poor, with marked evidence of recent loss of weight; colour, sallow. The temperature was normal; respirations, 24. There was marked myoidema and myotatic irritability. The chest showed numerous scratch marks and the typical double burrows of scabies. Scars were noted in the right lower quadrant, the site of an old appendectomy in 1900; another small scar in the left inguinal region, the site of incision for bubo.

The chest showed increased retrosternal dullness and dullness, with decreased breath sounds over the left upper front, axilla and whole back. The voice sounds

were greatly diminished in the above areas. Tracheal tugging was present. Pulse 80, regular, equal in both arms. Blood pressure: 146/94 (right); 144/90 (left). In the second right interspace, close to the sternum, there was a definite visible and palpable pulsation. In the third left interspace a pulsation was also noted, synchronous with that in the second right interspace. The apex beat was barely felt in the fifth left interspace, 9.5 cm. from the midsternal line. No thrill was noted.

CARDIAC DULLNESS

2 interspace	R. 3.6 cm.	L. 6.0 cm.
3 "	R. 6.0 cm.	L. 6.5 cm.
4 "	R. 5.0 cm.	L. 8.5 cm.
5 "	R. 4.0 cm.	L. 9.5 cm.

The sounds were poorly heard at the apex, but loud at the base. Throughout the whole præcordium there was an audible harsh, blowing systolic murmur, heard worst at the apex, increasing as one approached the pulmonary area, and loudest over the aortic region. Here a faint diastolic murmur could be heard. The aortic second sound was accentuated and slapping in character.

The abdomen revealed nothing of note. A penile scar was found. There were no abnormal findings in the nervous system.

Laboratory data.—Blood Wassermann test, positive (4 plus) to both antigens. Lateral films of the dorsal spines showed no erosion of bone. Fluoroscopic and antero-posterior plates of the chest showed an aneurysm of the ascending, the arch and the descending portions of the aorta. All other examinations were negative.

Clinical course.—Pain continued to be a constant and outstanding feature, requiring opiates for relief. On May 13th a friction rub developed in the left axilla, and the temperature rose to 100°. The following day the patient became drowsy, but was unable to sleep owing to constant, severe and uncontrollable pain. In the evening the temperature was again normal, but the pulse rate increased to 100 and the respirations to 26. There was evidence of parenchymal involvement of the lungs. The friction rub remained. On the morning of May 16th the temperature was normal; pulse 140, thready; respirations 26, and the patient appeared pale, drowsy and was perspiring slightly. The friction rub was still audible. Over the left nipple region there was definite blowing breathing and many coarse crepitations. Posteriorly, the left chest was flat to percussion. This extended to the mid axillary line, and over this area the breath sounds were barely audible. The signs suggested a pleural effusion over an atelectatic lung. The patient was considered to have also a low grade bronchopneumonia. Death occurred several hours later.

Clinical diagnosis.—Luetic aortitis; aneurysm, (a) sacular of the ascending aorta, (b) fusiform of the arch and descending aorta; left pleural effusion; atelectasis of the left lower lobe; bronchopneumonia; scabies; hæmorrhoids.

Abstract of post-mortem findings.—The body was opened by the usual Y-shaped incision, and on cutting through the costal cartilages of the left side an abundance of bloody fluid escaped. On exposing the pleural cavities, the right cavity contained no fluid and the right lung was emphysematous. The left pleural cavity was full of bloody fluid. The upper lobe of the left

* From the Medical Service, the Montreal General Hospital.

lung was slightly emphysematous and pushed downwards and forwards. The left lower lobe was greatly collapsed, compressed, and adherent to the left ventricle. On removing the left lung a large subparietal pleural hæmorrhage was exposed. This extended along the aorta from the level of the 7th thoracic vertebra posteriorly, filling the soft tissues in the upper mediastinum as well as all the soft tissues about the ascending portion and arch of the aorta and its regional branches. The clot extended over the apex of the left thoracic cavity and down its lateral and posterior wall to the level of the 7th thoracic vertebra. This mass of clotted blood, which measured 8 cm. thick, bulged into the cavity, displacing the lung downwards into the lower half of the cavity. The clot was covered by the thin layer of intact parietal pleura. The arch of the aorta was not seen because of the hæmorrhage in the soft tissues about it.

The heart and aorta were removed in one piece. On removal of the aorta, which was done from below upwards, its posterior wall was found to be completely absent opposite the 6th, 7th and 8th vertebrae. The 7th and 8th vertebrae were deeply eroded along the left lateral aspect, and the 6th and 9th vertebrae were slightly eroded. A portion of the wall of the aorta was absent in these regions of erosions, and the space about them was filled by a large blood clot. It was from this area that the blood had extravasated into the soft tissues about the aorta and beneath the left parietal pleura. In this region of the aorta there was a fusiform aneurysm, which extended to the beginning of the arch. The arch itself was slightly dilated. At the junction of the ascending portion and the arch of the aorta there was a small sacculated knob-like aneurysm, measuring 1.5 cm. across and 1 cm. deep. The wall near it was greatly thickened. The aorta showed some yellow raised atheromatous plaques throughout. The heart was not enlarged and the valves showed no gross lesion.

Anatomical diagnosis.—Penile scar (syphilitic); syphilis of the aorta; multiple aneurysms of the aorta; rupture of aortic aneurysm, with hæmorrhage into the mediastinum and left subpleural tissue; pressure erosion of the 6th, 7th and 8th vertebrae.

Aneurysm will always remain a subject of considerable interest, a fact already attested by the large amount of literature available on this subject. Aneurysm is found in 0.1 to 0.5 per cent of deaths in American cities and is found, *post-*

mortem, in about 1 per cent of cases. It occurs five times more frequently in males than in females, with the greater incidence in those between the ages of 35 and 40. All parts of the aorta may be affected, but the order of frequency is ascending, arch, descending, and thoracic aorta. In some cases more than one portion has been found to be involved in the same individual.

Of particular interest to the writer however, is the causes of death in aneurysm. Death may occur from three separate causes: (1) disease separate and distinct from the aneurysm; (2) death from the mechanical effects of the sac; (3) death from rupture. Of the above causes rupture accounts for more than 50 per cent of the deaths.

Rupture may occur into the pericardium; externally; right lung; left pleura; pulmonary artery; right bronchus; œsophagus; sup. vena cava; right ventricle; right pleura; left lung; left auricle; left bronchus; mediastinum; left ventricle; trachea; right auricle; spinal column; thorax; stomach; both pleura; neck; ant. mediastinum and left pleural cavity; subscapular muscles, etc.

The most frequent sites of rupture are into (1) the pericardium, (2) the left pleura, and (3) the œsophagus.

SUMMARY

This paper presents

1. A clinical report of a case of aneurysms of the thoracic aorta, with rupture, resulting in extra-pleural and mediastinal hæmorrhage.

2. A brief table is given showing the tissues and organs into which blood from ruptured aneurysms commonly escapes.

DANGERS IN BROMIDE THERAPY.—P. W. Preu, J. Romano and W. T. Brown report nine cases of bromide intoxication in the course of treatment of psychotic states, and draw practical conclusions. In eight of these cases deficient diet and dehydration seemed to be definitely concerned in the onset of poisoning, and the authors think that sufficient importance is not yet attached to this possibility. They insist that bromides must not be administered for long unless an adequate intake of fluids and chloride is maintained, and that a careful watch must be kept for symptoms of commencing toxicosis. The occurrence of a skin eruption is an unreliable criterion. Bromide therapy is unsuitable for states of severe excitement and agitation because it is not effective unless dangerously large doses are given. Paraldehyde is more effective and safer. Bromides should never be

used in cases of delirium due to toxic or infectious causes, and they should be administered with caution in arteriosclerosis, since delirium is easily induced thus if there is cerebral arteriosclerosis. Nephritis is a definite contraindication. The diagnosis of commencing bromide intoxication is not easy in some types of mentally disturbed cases, such as psychosis with cerebral arteriosclerosis, and it is often advisable to determine the blood contents of bromide and chloride simultaneously. General supportive treatment and the administration of chloride to eliminate the bromide from the tissues should follow a positive diagnosis of bromide poisoning; the authors give a high calorie soft diet rich in vitamins, and a minimum of 4,000 c.cm. of fluids daily, with about 10 grams of chloride in addition to the salt in the ordinary diet.—*New Eng. J. Med.*, January 9, 1936, p. 56. Abs. in *Brit. M. J.*

Case Reports

A HEPATO-CEREBRAL SYNDROME

(WILSON'S DISEASE)

By D. M. BALTZAN, M.D., F.R.C.P.(C.),

Saskatoon

The interest in this case centres in the calcium deficiency factor, the extensive naked-eye pathological cerebral changes, and because in other ways it conforms to a known group entity of certain brain changes with extensive liver cirrhosis. In the Hösslin and Alzheimer pseudo-sclerosis the pathological changes are not visible to the naked eye and are diffusely scattered throughout the greater part of the brain. The changes in Wilson's disease are macroscopic, but confined to the putamen of the lenticular nucleus. The consensus favours the view that pseudo-sclerosis and progressive lenticular nucleus degeneration are essentially the same disease. With variations, as stated above, it is reasonable to include this case in the same category and perhaps further enlarge the scope of this rare syndrome.

A boy, fifteen years of age, was admitted to St. Paul's Hospital on October 29, 1933. He stated that he was unable to control his hands and fingers. This was more pronounced on the right side. His gait was impeded by stiffness in the legs. The onset was insidious, dating back six months, and signs were slowly but definitely progressive. It was obvious that there was a spastic condition of the extremities, and marked disability due to incoordination in performing finer movements, and an irritability of muscle groups was noted in the course of manipulation. In the same way, on gradually compressing the forearm muscles a positive Trousseau sign was obtained. The immediate general impression was that of chronic tetany. This was supported next morning by a blood calcium finding of 5 mg. per 100 c.c. of blood.

The patient enjoyed his usual good health and continued at technical school up to date in spite of an increasing handicap in handling a typewriter, and progressive failure in penmanship. Difficulty in walking became apparent later. He had gained in weight and grown noticeably in height during the past year. There had been no other disturbances in function. He had had chicken-pox and whooping-cough as a child. There are four brothers and one sister living and well. The parents are living and in good health. No member known to the family had ever suffered from any muscular atrophies, nervous diseases or conditions of a similar nature.

Examination showed a well built, well nourished young man. It seemed that his psychic or emotional reactions were not exactly equal to the amount of intelligence he showed. While cooperative in every way, he seemed more amused than concerned with what was being done. He lacked adequate facial expression. The general physical findings were normal. Attention was

focussed early on evidence pointing to parathyroid, hepatic and residual signs of rheumatic disease (chorea), but no positive indications were obtained. Neurological signs were carefully scrutinized. All the cranial nerves seemed intact. There was a bilateral minor nystagmus with increased frequency pointing to the right. The cranial reflexes, including the ciliary spinal, responded adequately except for slight diminution of both corneal reflexes. There were no ocular signs. Fundi normal; vision 20/20 both eyes. Perimetry was not done. All the deep reflexes were equal and not especially active. Some doubt as to plantar response existed; otherwise the superficial reflexes were normal; the sphincteric reflexes were normal. A slight bilateral ankle clonus was obtained. The Romberg sign was not elicited. There was no muscular weakness or atrophy, but spasticity was marked, especially in both forearms. A character-



Fig. 1.—The patient in November, 1933, as seen on first admittance. Fig. 2.—Microscopic section of liver tissue, high power.

istic posture of the hands while at rest was like the obstetrical position. There were no athetoid movements, but a "massive" response of the whole of a limb or limbs in attempting to carry out a movement. Chvostek's sign was not present; Trousseau's sign was present. There were no sensory changes. The gait was paraplegic in type.

A diagnosis of chronic tetany was made and of probable progressive lenticular nucleus degeneration of Wilson. The latter interpretation was based on suggested basal ganglia features, such as facial expression, emotional reaction, nystagmus and unrestrained muscular tonicity, as an alternative explanation of the tetanic pattern. A variation of the syndrome of Wilson was also postulated, having in mind a parathyroid analogue of the hepatic involvement in this disease. Positive hepatic failure could not be demonstrated at any time during the illness.

Laboratory details: x-rays of various bones, on admission, showed no pathological changes. One year later they were the same. Blood count: hæmoglobin, 60 per cent; red blood cells, 3,520,000; white blood cells, 7,000; polymorphonuclears, 60 per cent; lymphocytes, 39 per cent; eosinophiles, 1 per cent. The blood Wassermann test was negative. Urinalysis, negative. Repeated blood calcium estimations were made as follows (quoted as mg. per 100 c.c. of blood): November 2, 1933, = 5. November 3, 1933, = 6. November 11, 1933, = 6.1 (control specimen by Clark-Collip's modification of Kramer-Tisdale method). November 13, 1934, = 8.4. November 14, 1933, = 7 and blood phosphorus = 2.5. November 21, 1933, = 8.9. November 25, 1933, = 8.7. April 9, 1934, = 6.5 and phosphorus, = 3.5. October 10, 1934, = 12 and phosphorus, = 6.5. During several periods of hospitalization the temperature was always normal. Basal metabolic rate in December, 1933, was plus 20. * Van den Bergh test (immediate direct reaction), gave 7 mg. bilirubin per 100 c.c. of blood.

Progress was not characterized by new developments, but rather by aggravation of the same features. A re-enforced calcium régime, including parathormone administration, showed no clinical improvement and a disappointing blood calcium response. The behaviour on occasions suggested hysteria. Under anaesthesia the hands, fingers, etc., were completely relaxed. All the joints were freely moveable. On return to consciousness spasticity appeared in the upper limbs first and the legs last. In the final stages of the disease rigidity was so marked as to make the patient entirely incapable of looking after his own needs. Mental changes assumed a regressive infantile behaviour type. He was admitted to the Provincial Mental Hospital. Death followed shortly afterwards, approximately two years from the onset.

Autopsy was performed on August 11, 1935, by Dr. F. S. Murray and is reported as follows. A tall, slim, young male adult, white, emaciated. The lower limbs were swollen. Trochanteric areas showed superficial trophic sores. The upper limbs were flexed, the hands clenched and the thumbs in palms. The lower limbs were slightly flexed and deviated to left.

Cranium.—The membranes were thick, especially on the vault. They were grey, soggy, the vessels, wide and white. Inspection showed a generally oedematous condition. Section showed the upper half of frontal and temporal lobes, right and left, to be fluid. The grey matter was thinned, the sulci shallow, and the convolutions narrowed. Posteriorly there was atrophy of the convolutions. The ventricles were dilated. Cerebellum, pons, and medulla were negative. Sections of cord were removed for examination.

Thorax.—The pleural fluid was not increased. Lungs: bases congested, on section, spotted with static blood. The pericardial sac showed the usual free fluid. Heart, small, soft. Myocardium pale. Mitral cusps thickened.

Abdomen.—Fat and fluid in very small amounts. The appendix was thick and juicy. The liver was small, markedly nodular. The nodules were of the size of a garden pea; no normal liver tissue seen. The gall bladder was tiny. The head of the pancreas was hard. The kidneys were relatively large, uniform, and, on section, dark. The capsules stripped with some difficulty. The urinary bladder was distended, thin-walled, otherwise negative.

Conclusions.—Death from bilateral cerebral softening (encephalomalacia); chronic hepatitis; myocardial degeneration.

Dr. O. C. Gruner reported on the microscopic sections of the liver. The chief change was a multilobular cirrhosis of marked degree. The cells in the liver lobules nearest the fibrous tissue were very greatly swollen and had a watery appearance, as there was no structure visible except the nuclear membrane itself. The cells towards the centres of the lobules presented a more normal, or nearly normal, appearance. Enormous "proliferations of the bile-ducts", perhaps really a regeneration of liver tubules were noted, besides dense inflammatory cell infiltration in clusters and diffusely, to a less extent, all through the fibrous tissue. The cells were especially closely packed round the periphery of the lobules. The blood vessels were thick-walled. The appearances indicated a definite local toxic action or reaction. Whether this toxic substance was primary in the liver or extraneous remains a question. In the same section one has the direct action on the liver cells from an extraneous cause and the local reaction due to primary liver-cell derangement.

A CASE OF CONGENITAL MALFORMED FIRST DORSAL RIB*

BY CHARLES K. P. HENRY,

Montreal

Malformations, congenital deficiencies, and errors in anatomical development are so common that a case presenting one of these, an incomplete first rib, would not be worthy of reporting, except for the extraneous condition that led to the production of the symptoms for which the anomaly was responsible.

Cervical ribs were described by Galen, and yet it was not until 1818 that we find any further records in medical literature. It is then stated that Astley Cooper treated patients for pain due to this condition. In fact, the first operation of resection of a supernumerary first rib for the relief of pain was performed by Coote in 1861. Of still more recent date (1892), we find recorded the third operation; until 1895 only 8 cases had been operated on; and in 1906 Keen could find only 42 cases of successful operation recorded. Later, Brickner, Milch, Mosley and others drew attention to cases in which pain in

* Read, in conjunction with Dr. C. W. Fullerton, at a meeting of the Montreal Medico-Chirurgical Society, on February 15, 1935.

the upper extremity was produced by pressure on the brachial plexus by abnormal first ribs, or even by normal first ribs. Their pressure effects on the subclavian artery also has been recognized for some time, and surgical removal of the first rib, or, later, simple division of the scalenus anticus at its insertion has produced lasting relief from the symptoms due to pressure on this artery.

CASE REPORT

On March 4, 1934, Mr. A.C., aged 36 years, complained of sudden, stabbing pain in the left lower chest, associated with dyspnoea. The pain was aggravated by breathing or movement. Examination of the patient by Dr. C. W. Fullerton indicated that he was in pain, that his respirations were shallow and rapid, that there was no marked dyspnoea so long as he lay quiet, but there was slight cyanosis of the lips. He had no cough. All the signs of a left-sided pneumothorax were present, bulging of the left chest, with expansion practically nil. Tactile and vocal fremitus were much decreased, the percussion note was almost tympanitic, while the breath sounds were absent. The heart was markedly displaced; the right border extended 7.5 cm. from the midline. The sounds, though rapid, were of good quality. There was some gastric dilatation. As there was no great circulatory embarrassment, aspiration of air from the left pleural cavity was deemed unnecessary.

A skiagram, taken twelve days after the onset, revealed a partial pneumothorax, and showed no shadows suggesting tuberculosis. A Mantoux test was negative. About a month later the chest appeared normal on physical examination, but the man still complained of pain over the left chest anteriorly, and the overlying skin seemed to be hyperæsthetic. The maximum points of tenderness varied from day to day, and the actuality of the severe pain complained of was doubted. On May 3rd, after having been up for a few days, he again complained of stabbing pain in the left axilla, and a partial pneumothorax was found. On May 9th he again suffered complete collapse of the left lung, and dyspnoea, pain and shock were more marked than with the preceding attack. He picked up slowly, and complained of even more pain in the left chest. By this time there was no doubt but that the skin on the left upper chest anteriorly and in the axilla was definitely hyperæsthetic.

His fourth and last attack of pneumothorax occurred on June 3rd. It was similar to the previous ones except that he was even more prostrated. Within a few hours it was thought that the perforation of the visceral pleura was sealed over, as his condition had improved, in spite of the fact that no air had been removed.

In June he presented a markedly positive tuberculin skin reaction. He developed new symptoms of pain in the left upper arm, the left side of the neck, as well as in the left upper chest and axilla. The skin over these parts became very hyperæsthetic, but the pain areas did not correspond to any distribution of spinal nerves.

A few weeks later it was noted that the left hand and axilla were perspiring profusely, and the temperature of these areas was definitely higher than on the right side. There was considerable loss of power in the arm. It was felt that his symptoms were caused by some pressure on the cervical sympathetic nerves which had resulted in partial paralysis, as evidenced by the sweating and increased temperature of the affected areas. It was considered, further, that the pneumothorax and cervical sympathetic nerve involvement must have some common etiological origin, with, possibly, even the presence of an apical lung tumour. Skiagrams of his chest, cervical spine

and upper arm were taken, and the presence of a rudimentary thoracic rib was found on the left side. On re-examination of the previous x-rays, the rib could be seen, but it had been overlooked.

The patient was then re-admitted to the Montreal General Hospital, on November 23, 1934, eight months after his primary pneumothorax, and five months after his last one. Examination revealed sweating of the left palm, of the inner arm and of the axilla, with pain in the two latter areas and the left upper chest wall laterally. The pain was not referable to the segmental distribution of spinal nerves. On November 26, Dr. Fullerton established that there was an increase in the surface temperature of the left upper extremity from 0.3 to 4.6 degrees C. in various areas, the greatest difference being in the fingers.

This difference in temperature was easily made out by touch. There was marked hyperæsthesia and the arm often was found to be dripping with perspiration. There were, as well, apparent muscular weakness and limitation of movement due to pain in the upper arm. The blood pressure was equal in both brachial arteries. Dr. F. H. Mackay examined him on November 26, and considered the signs were due to irritation of the sympathetic nerve supply of the arm and thoracic wall.



Fig. 1.—Left first rib, incomplete in central third; pneumothorax in apical region. Fig. 2.—Entire first rib and vertebral half second rib removed.

On December 1, under gas oxygen anaesthesia, by means of a posterior incision the rudimentary first rib was removed entire, and at least half of the second rib, which was necessary to allow access to the first. The sympathetic trunk was uncovered and was clearly seen lying in the depth of the wound, and the stellate ganglion was seen also. The patient showed no shock at the close of operation. Within a period of not more than forty-eight hours, the hand, forearm, axilla and outer thoracic wall were distinctly

drier and not so hot. Three weeks later, a further temperature test by Dr. Fullerton revealed that there was no greater difference in temperature than 0.4 degrees C. at one part of the arm only, and elsewhere the two extremities showed the same corresponding readings, or with a variation of only 0.2 degree C.

Skin temperatures		November 26, 1934	
		Right	Left
Arm			
medial		31.5° C.	31.8° C.
lateral		30.1	30.1
Forearm			
dorsal aspect		31.3	31.3
palmar aspect		30.3	31.1
Hand			
dorsal		29.3	30.6
palmar		29.4	31.9
Fingers			
1		24.8	27.7
2		25.1	29.7
3		24.8	29.3
4		24.1	29.4
5		23.6	27.9
Axilla		32.0	33.9
Supraclavicular fossa		31.9	33.0

Skin temperatures were taken after exposure to room temperature for 30 minutes.

Skin temperatures		December 21, 1934	
		Right	Left
Arm			
medial		30.3° C.	30.1° C.
lateral		29.3	28.9
Forearm			
dorsal aspect		29.6	29.6
palmar aspect		29.7	29.7
Hand			
dorsal		28.6	28.5
palmar		28.9	28.8
Fingers			
1		29.5	29.5
2		29.5	29.5
3		29.9	29.7
4		29.8	29.6
5		29.7	29.5
Axilla		31.9	31.8
Supraclavicular fossa		31.6	31.5

The patient is now, March, 1936, well, free from pain and with no thermal disturbances in the left upper extremity.

Clinical and Laboratory Notes

A BACTERIOLOGICAL STUDY OF THE NEW SURGICAL MASK "JEL"*

BY ARMAND FRAPPIER AND LIONEL FORTÉ,

Montreal

A new surgical mask, called "Jel", was submitted to us for bacteriological study and we have undertaken to compare its efficiency with that of the mask "Mephisto", employed in many hospitals.

The mask "Jel" is essentially a filter made of small cotton wool balls attached to a hard paper holder which is easily adapted to a special piece of cloth (Fig. 1). By means of laces the mask is folded, and at the same time the filter is wrapped in such a position that a chamber is formed (Fig. 2). When the mask is applied to the face, it covers the nostrils and mouth nearly hermetically, but provides enough space for lip movements and easy breathing (Fig. 3). The mask "Mephisto" is composed of a cotton layer surrounding the head and face, the eyes and their immediate vicinity excepted. This layer is doubled in front of the mouth and nose (Fig. 4).

In such experiments three main factors are to be considered: (1) the average number of bacteria in the air of the empty room used for the work; (2) the average number of bacteria expelled by the experimenter when talking

or reading loudly without a mask; and (3) the average number of bacteria which pass through the masks during periods of time comparable in the above experiments.

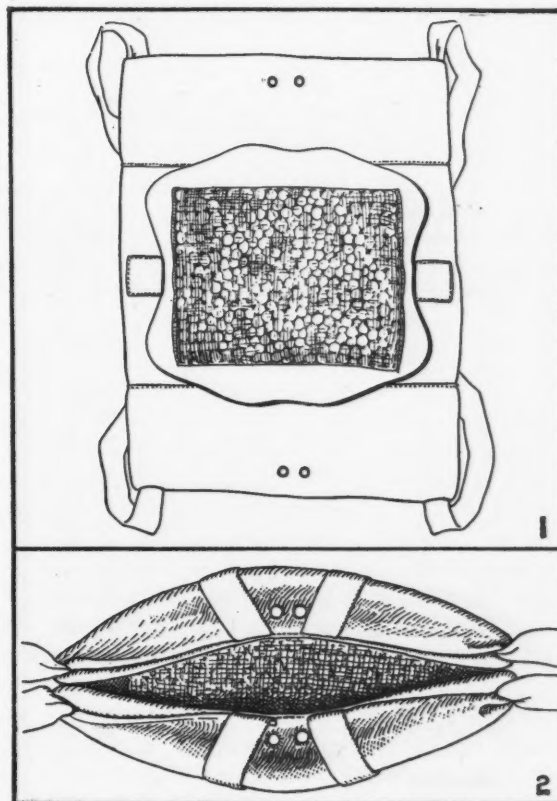


Fig. 1.—The filter applied to the envelope.

Fig. 2.—The mask closed ready for use.

* From the Clinical Laboratory of St. Luke's Hospital, Montreal.

We have employed the following method, by which we believe surgical masks may be bacteriologically tested in a rigorous way. The same room, 15 feet by 15 by 10, kept well closed and isolated from the outside, was used throughout the experiments. Early in the morning, about one hour before the reading with the "Jel" mask, experiments were always done to determine the average number of bacteria in the air



Fig. 3.—The "Jel" mask.

Fig. 4.—The "Mephisto" mask.

of the empty closed room. The same experimenter did three readings: one of one hour, before noon, with the "Jel" mask; one of one hour, in the early afternoon, with the "Mephisto" mask, and, one hour later, one of one-quarter of an hour without a mask. The experiments without a mask lasted only a

quarter of an hour because the number of colonies is sometimes so high that talking longer would have rendered the count impossible. In this case the number of colonies for one hour was calculated on the basis of the number found during a quarter of an hour.

In the centre of the room stood a large table upon which was placed a book holder, two feet in front of the experimenter. We used blood agar plates arranged as follows: one close to the book holder, one at one foot to the right of, and one at the same distance to the left of the book holder, another on a chair placed three feet in front of the table. Behind the experimenter, along the wall, were also arranged four plates, the two end ones being in the corners, the centre ones being three feet apart. The experimenter entered slowly into the room. He opened the plates and sat down reading out loud, the mouth at an angle of 30° from a line drawn perpendicular to the table. The plates were incubated for 48 hours at 37° C. Eight series of such experiments were carried out by three different experimenters, some having bad colds. They also coughed twice each quarter of an hour.

RESULTS

We have noted that the quantitative distribution of bacteria in the empty closed room was very uneven, since plates usually differed in number of colonies from one another in the same experiment. Therefore we found it necessary to calculate an average out of many plates

TABLE I.

SHOWING THE AVERAGE NUMBER OF COLONIES IN FRONT AND REAR PLATES

Number of Experiment	Average number of colonies per plate. Closed room air—1 hour	Average number of colonies per plate. One hour reading with "Jel"		Average number of colonies per plate. One hour reading with "Mephisto"		Average number of colonies per plate. One hour reading without mask.	
		Front	Rear	Front	Rear	Front	Rear
1	12.0	78.0	46.0	76.0	36.0	340	72
2	20.0	22.0	24.0	52.0	20.0	1720	36
3	33.5	24.75	8.0	73.75	59.0	270	116
4	14.0	15.0	20.0	20.75	20.0	155	60
5	19.8	20.0	17.5	22.75	14.0	625	32
6	11.75	16.50	19.25	29.75	23.25	34	34
7	18.17	18.75	15.50	21.75	22.34	160	49
8	21.0	28.50	33.0	28.75	23.50	211	84
Total averages	20.41	27.06	22.31	40.69	27.26	460	57.22
Number of colonies in air is subtracted.		20.41	20.41	20.41	20.41	20.41	20.41
Absolute numbers.....		6.65	1.90	20.28	6.85	439.59	36.81

in each experiment, with or without a mask. Moreover, as shown by Table I, the variation between each series of experiments also necessitated the establishment of the final results on a reasonable number of such series of experiments. Table I shows the average number of colonies per plate, for one hour, in the four front plates and the four rear plates in each experiment, with or without a mask, and in each experiment of air control. The total averages are given. Then the average of air control is subtracted, and the results are the absolute average numbers of colonies per plate. These results show that the plates behind the experimenter cannot be used as air controls during the experiments because they contain more bacteria than the real air controls made as described above. This table shows also that both masks retain a good many of the bacteria, if one compares the number 6.65 for "Jel", and 20.28 for "Mephisto" to the number 439.59 for experiments without a mask, all these numbers being the averages in the front plates. But, the same comparison shows an appreciable difference between both masks, "Jel" allowing fewer bacteria to pass through than "Mephisto". Considering the rear plates, one may see that the number of bacteria projected back of the experimenter varies with the mask, being much less in both cases than without a mask. It is from 1.90 for "Jel" to 6.85 for "Mephisto". Without a mask the number is 36.81.

The bacteria which have grown in the plates after talking without a mask are mostly staphylococci, streptococci of the viridans type, Gram-negative cocci, and a few moulds and fungi. After reading with a mask the same kind of bacteria are found, in much smaller quantity of course. The air bacteria are staphylococci, moulds and fungi, and other bacteria which we did not identify.

Table II shows compared percentages calculated from the average number of colonies in

TABLE II.
COMPARISON OF PERCENTAGE OF EFFICIENCY

	"Jel"	"Mephisto"	Without Mask
Average number of colonies of front and rear plates in absolute numbers.....	4.27	13.56	238.20
Percentage when compared to number of colonies without mask.....	1.79%	5.69%	100%
Percentage of efficiency.....	98.21%	94.31%	

front and rear plates. One hundred is the percentage of colonies after reading without a mask. In every case, it is understood that the average number of the control air colonies has been subtracted. In this way, the efficiency of the "Jel" mask was found to be 98.21 per cent as compared with 94.31 per cent for the "Mephisto" mask. In other words, the mask "Jel" allowed 3.18 times fewer bacteria to pass through than the mask "Mephisto". Moreover, the "Jel" mask is much more comfortable, especially since it prevents the formation of hot air currents and the deposition of moisture on glasses which act as a serious handicap in the use of masks of the "Mephisto" type.

It seems to us that these results are sufficiently significant to call the attention of the surgical profession and others interested to the "Jel" mask.

REFERENCES

- GAUTHIER, P. P.: Présentation d'un nouveau masque chirurgical, *Bull. Ass. M.L.F.A.N.*, 1935, 1: 77.
- WALKER, I. J.: How can we determine the efficiency of surgical masks? *Surg., Gyn. & Obst.*, 1930, 50: 266.

DANGERS OF REPEATED CÆSAREAN SECTIONS.—To illustrate the dangers of repeated Cæsarean sections and to emphasize the importance of intervening in such cases before complete enlargement of the pregnant uterus, preferably at eight or eight and a half months and always before the commencement of labour, L. Gérin-Lajoie records a case in which this operation had been performed in the last three of five previous pregnancies. In the last confinement uterine rupture at the old cicatrices occurred, and, though the patient survived, her condition was rendered critical by shock. The child was alive when the patient was admitted to hospital, but was

born dead. The author advises that patients with a history of previous Cæsarean sections should be hospitalized before labour pains commence if these begin some weeks or months before the presumed date of labour. He believes that if intervention had been earlier in the present case the infant would have survived. The repeated contractions and examinations, with the time lost in operative preparation, not only brought about its death but also caused maternal hæmorrhage sufficient to provoke very great shock, to which must be added the traumatic shock of the intervention and of the anaesthesia.—*L'Union Méd. du Canada*, December, 1935, p. 1414. Abs. in *Brit. M. J.*

Editorial

CERTAIN FORMS OF TREATMENT OF CORONARY DISEASE

THE great danger inherent in coronary thrombosis, apart from the immediate shock, lies in the fact that a portion of the heart wall is suddenly cut off from its nutritive supply and consequently dies. If the infarcted area is large we are likely to get cardiac aneurysm, with intracardiac thrombosis and its own particular dangers, and, in the worst event, rupture of the heart. Even if death does not occur at once or within a few hours the disability eventually may be considerable, leading to cardiac decompensation. Some, but not many, patients may be little the worse. A consideration of the character of the lesion leads one to infer that if we could improve the collateral circulation, either by a drug or by some appropriate surgical procedure, we would have a rational treatment which might be expected to do good. Some recent experiments and clinical observations support this idea.

The work of Fowler, Hurevitz and Smith¹ is encouraging. These observers exposed the heart in six dogs and then ligated the anterior descending branch of the left coronary artery together with the accompanying vein, just above the origin of the last main branch. Almost immediately an area of cyanosis appeared distal to the ligated point, which reached its maximum in about five minutes. They then injected 2 c.c. of theophylline ethyldiamin intravenously and noticed a marked diminution in the amount of cyanosis. From 50 to 90 per cent of the cyanotic area regained its normal colour and became indistinguishable from the rest of the heart wall. The late effects of ligation were studied in 19 dogs. Nine of them were given the drug orally, in doses of 0.195 g. (3 grains) daily, after being operated on; the other 10 were kept as controls. The resulting area of fibrosis was markedly less in those animals which had received the drug. The authors, therefore, recommend

the use of theophylline ethyldiamin in the treatment of acute coronary occlusion in human beings.

Smith, Rathe and Paul² report their experience with theophylline and theophylline ethyldiamin in the treatment of coronary disease manifested by decompensation, paroxysmal dyspnoea, angina of effort, and coronary occlusion. They had favourable results in 72 of 110 cases of paroxysmal dyspnoea, angina of effort, and coronary occlusion. The action of the drug was prompt and usually evident in all cases in which it was possible to restore the cardiac function. These authors emphasize the point that the use of the drug should be regarded as only one element in the treatment, and that it should not be employed to the exclusion of other established means of restoring the function of the heart. Their treatment consisted in rest in bed, a cardiac diet, liquid petrolatum, $\frac{1}{2}$ grain of phenobarbital after meals and at bedtime, and $\frac{1}{4}$ grain of morphine when required for sleep; theophylline ethyldiamin $1\frac{1}{2}$ to 3 grains, three times a day, was added, and, occasionally, digitalis. They recommend that theophylline be prescribed as soon as the diagnosis of coronary disease is established and that the drug should be continued over a long period of time. Other members of the theobromine group, notably, theobromine alkaloid, theocin, and diuretin, this last, in 15 grain doses three times a day, have also been recommended.

These drugs apparently work by inducing(?) or favouring the production of a collateral circulation. Recently attempts have been made to bring the same result about by surgical measures. Basing themselves on an observation of Thorel's,³ who reported a case of complete obliteration of both major coronaries in which pericardial

1. FOWLER, W. M., HUREVITZ, H. M. AND SMITH, F. M.: The effect of theophylline ethyldiamin on experimentally produced cardiac infarction in the dog, *Arch. Int. Med.*, 1935, **56**: 1242.

2. SMITH, F. M., RATHE, H. W. AND PAUL, W. D.: Theophylline in the treatment of disease of the coronary arteries, *Arch. Int. Med.*, 1935, **56**: 1250.

3. THOREL, C. H.: Pathologie der Kreislauforgane, *Ergebn. allg. Path. u. path. Anat.*, 1903, **9**: 559.

adhesions seemed to have saved the situation, for a time at least, through the provision of an accessory blood supply, Beck and Tichy carried out some experimental studies to elucidate this point. Beck started the work in 1932, and Beck and Tichy, (1935),⁴ working on dogs, found that after they had produced by certain mechanical means adhesion of the two layers of the pericardium they could in some cases produce almost total occlusion of both coronary arteries without causing death. It is of interest to note that the anastomosis between the vessels of the pericardium and the myocardium only took place when the latter was rendered ischæmic, that is to say, when physiological function called for an increased circulation. In a second communication Beck and Tichy,⁵ in a study of 94 patients suffering from occlusion of a major coronary artery, state their conviction that in 43 there was a time after the first attack when the production of an extra-cardiac collateral circulation might have been feasible and beneficial. Shortly after, Beck operated on several human beings⁶. In the case of a man, aged 48, diagnosed as having had for nine years coronary sclerosis and angina, a flap of the left pectoralis major was sutured to the inner surface of the parietal pericardium. The two surfaces of the sac were roughened with a burr and bundles of intercostal muscle and the median edge of the pectoralis were attached to the outer surface of the parietal pericardium. Seven months later the patient, a gardener, was working and free from pain. Subsequently, six other patients were operated on. In one there was a good result and in another slight improvement. Sufficient time had not elapsed to assess the results in the other four. L. O'Shaughnessy,⁷ working with cats and greyhounds, used a graft of a pedicle of omentum brought through the diaphragm. After ligation of a coronary had been performed injections of

dye demonstrated vascular connections between the graft and the myocardium.

This work is both logical and promising, and is a striking demonstration of the value of experimentation as applied to practical clinical problems. Yet, it is evident that there are limitations to the adoption of such results. Many patients with moderate coronary occlusion, as indicated by angina of effort, can often carry on for years with but little discomfort under medicinal treatment and with attention to some simple rules, and a certain number apparently recover completely. It is doubtful whether such persons or their doctors would consent to a major surgical operation. Again, in those cases where the damage is extensive, as when associated with angina of rest and cardiac decompensation, the operative risk would appear to be too great. Further observations, over a period of years, will doubtless be required to establish the indications which can properly call for such measures.

The operative procedures that up to the present have been more commonly in vogue fall under three headings: (1) section or removal of a part of the cervical sympathetic nerves or ganglia on one or both sides; (2) section of, or injection of alcohol into, the upper thoracic sympathetic ganglia or the corresponding dorsal nerve roots; and (3) the total removal of the thyroid gland.

The operation of cervical sympathectomy, introduced in 1916 by Jonesco,⁸ adopting a suggestion made by Francois-Franck seventeen years previously, has practically been completely abandoned, as the results did not seem to justify the procedure.

The paravertebral injection of alcohol into the dorsal nerve roots of the left side was introduced by Mandl⁹ and has been frequently attempted since. Figures from the Massachusetts General Hospital and from the Presbyterian Hospital go to show that this treatment is of great value, the pain being greatly relieved in about half the cases and moderately relieved in from 25 to 30 per cent. Failure occurred in from 12 to 30 per cent., attributed to technical

4. BECK, C. S. AND TICHY, V. L.: The production of a collateral circulation to the heart, *Am. Heart J.*, 1935, **10**: 849.

5. *Ibid.*: The production of a collateral circulation to the heart, II, *Am. Heart J.*, 1935, **10**: 874.

6. BECK, C. S.: The development of a new blood supply to the heart by operation, *Ann. of Surg.*, 1935, **102**: 801.

7. O'SHAUGHNESSY, L.: An experimental method of providing a collateral circulation to the heart, *Brit. J. of Surg.*, 1936, **23**: 665.

8. JONESCO, T.: Angine de poitrine guérie par la résection du sympathique cervico-thoracique, *Bull. Acad. de Med.*, 1920, **84**: 93.

9. MANDL, F.: Die Wirkung der paravertebralen Injektion bei "Angina pectoris", *Arch. f. klin. Chir.*, 1925, **136**: 495.

difficulties in placing the alcohol.¹⁰ The operation is safe, without serious permanent complications, and without mortality. Surgical resection of the upper four thoracic ganglia is more serious, carrying with it, according to James White, of Boston, a mortality of 25 per cent.

The operation of complete thyroidectomy is very much to the fore at the present time. It is probably too soon to come to any final conclusion as to its value. Undoubtedly after the operation the majority of the patients are relieved of their anginal pain. On the other hand, they are subjected to certain surgical hazards of grave character. The most important of these are sudden death within a few hours of operation, pulmonary complications which may cause death within a few days, injury to the re-

current laryngeal nerve, and parathyroid insufficiency. The danger from myxœdema, while perhaps not so great as was at first feared, is by no means to be ignored. There is no doubt that some patients, while it is true they have been relieved of pain, have been made worse in other respects. It is certain that the candidates for thyroidectomy have to be selected with great care. At the moment we may say this. Those patients who are suffering from active coronary disease, acute rheumatic fever, repeated pulmonary infarction, recent vascular accidents, congestive heart failure that cannot be relieved by rest in bed, malignant hypertension, renal insufficiency, and thyrotoxicosis, should not be subjected to this operation. Marvin (*loc. cit.*) thinks that for the time-being thyroidectomy should be reserved for a few patients in whom pain makes life intolerable or prevents the earning of a livelihood.

A.G.N.

10. See MARVIN, H. M.: An evaluation of the surgical treatment of angina pectoris, *Bull. New York Acad. of Med.*, 1935, 11: 453.

MATERNAL MORTALITY

THE Canadian Council on Child and Family Welfare has recently published a Report on Maternal Mortality as it exists in Canada to day.* This report, "Need our Mothers die?" covers the whole of Canada for the past nine years, and represents our first national endeavour to count the cost—the cost of motherhood—in terms of death and disablement. And to this is naturally added the natal and neo-natal death rate of the children. It is indeed an illuminating and comprehensive report, and should be read by every one of us, by the professional and lay reader alike. For we are shown first our own Canadian case, and then there follows a comparison with the case of others. We learn that our maternal mortality is high, rating from the fifth to the twelfth highest among the twenty-nine countries that are mentioned.

We suffer somewhat in this comparison. Our own case is summarized in the following way, taking an average of the last five years. In Canada in such an average year 230,000 babies are born and in the process 1,200 mothers die—our best citizens—and 23,000

are more or less permanently disabled; and, again, some 16,000 of their babies die, 75 per cent. of these within the first month. We are reminded that these mothers are cut off in the very prime of life, (their average age was 31), and in the very midst of their highest usefulness; and by their death there are left each year some 5,305 motherless children. A high usefulness indeed!

And again we are shown that a full half of this loss might be avoided, this irreparable loss from death and disablement. For sepsis, hæmorrhage and the toxæmias are the deadly enemies within our gates, accounting, as they do, for 70 per cent. of this death-rate. And we are rightly told that we can close these gates, or nearly so, against them. This is the Canadian picture as drawn in this Report.

Surely in this year of Grace, 1936, the time is ripe to mend the trouble. For this maternal death-rate is one of the most urgent considerations respecting our national health. Prof. Munro-Kerr, of Glasgow, emphasises this truth when he says—"No health problem can be of greater consequence to a nation than Maternal and Infant Welfare". We agree with this, and also agree that in any campaign or undertaking it is

* Need our Mothers die? Division of Maternal and Child Hygiene, Canadian Welfare Council, Ottawa, 1935.

always wise to begin at the beginning—and the beginning of our national health lies with the mothers and the children. So, first of all, we must take better care of these. And, now, how are we to do it? This Report indicates the terms of this care, and the appropriate treatment, adapted as it must be to both our urban and our rural life. The cheerful part of this business is that the fit and proper treatment lies well within our reach. For in Canada we are rich with our abundant facilities, rich in our medical and nursing professions, our medical schools and hospitals, public health services, federal, provincial and municipal. We have, moreover a Social Hygiene Council, a National Health League, and all kinds of Social Service, Home Bureaus, and Health Units. There is an abundant medical literature, a sympathetic lay press, with its newspapers, journals and magazines, and, last of all, the radio. Yes, we are rich, but our urgent, absolute need is a coordinate plan, a nation-

wide organization, a unity of command for our battalions. We must not dissipate our efforts by the undertaking of too many things at once. No! let us take one thing at a time and concentrate the effort. Above all things we must avoid the crippling effects of rival agencies, the over-lapping, and the waste. We say again, let us begin at the beginning, with the mothers and the children. There is no question but that Maternal Mortality is a chief interest and concern throughout the civilized world to-day.

As this Report shows, in Canada we have made a good beginning in maternal and infant care, but so far our efforts have been individual and sporadic. We must unify and unite these efforts, and generally apply them; we must do this if we are to succeed in this important business, so vital to the well-being of our national life. We congratulate the Welfare Council, its Governors, and its Executive, upon this timely and important work.

W. W. CHIPMAN.

Editorial Comments

The Presentation of Papers at Annual Meetings

Some little time ago a communication from a correspondent was brought to our attention in which the writer, commenting on the programs of Annual Meetings, stated his conviction that the value of the papers presented was lost to a considerable extent because of lack of discussion. Beyond doubt, the point is well taken. A short paper, with the points logically and clearly stated, followed by the comments of men competent to speak, is what is needed. These desiderata can always be met. It only requires a little self-restraint on the part of the reader of the paper, and some planning on the part of the Program Committee to ensure that men conversant with the subject are on hand to do their part.

It is widely accepted that the presentation of a paper should not take longer than twenty minutes. No matter how important the subject, it is always possible to meet this requirement. A paper occupying ten to twelve quarto pages of typewriting, double spaced, can be read in that time. Those who are to discuss the paper should be restricted to five minutes each, and the reader of the paper may have ten minutes to reply. It is easy to say, of course, that the chairman of the General Meeting or of a Section has the matter under his control. Doubtless, he has, but it is difficult to stop the reader in the middle of his argument, and if this be done

the effect of the paper is lost. In practice, the reader "plods his weary way" until he has finished. Then, there is no discussion, or what there is is perfunctory and commonplace. We would respectfully make these suggestions. Let the author of a paper draft it out as he would wish it to appear in a journal, with suitable headings and a correct bibliography on the lines of that recommended here, i.e., with the items in the following order—author's name; initials; title of paper; year; volume number; and page. In the case of a book, give the author's name; his initials; the title; place of publication; the publisher's name; the year of publication; and the page. All bibliographical references should be carefully checked by the author of the paper before the paper is presented, in order to ensure that they are correct. We frequently find that references are incorrect. Having done all this, let the author "edit" his paper and reduce it to the desirable reading length. If he would then make out a brief summary and send it to the Program Committee that body could arrange to submit it to a number of competent persons who would then come to the meeting prepared to discuss the paper intelligently. After presentation of the subject the *complete* paper should be handed in for publication.

The attention of our readers is also directed to certain sections of our new By-Laws which are intended to facilitate our work in another

direction. Chapter IX, on Addresses and Papers, reads as follows:—

"Section 1.—All addresses delivered at an annual meeting shall immediately become the property of the Association, to be published or not, in whole or in part, as deemed advisable, in the *Journal* of the Association. Any other arrangements for their publication must have the consent of the author or of the reader of the same and of the Editor of the *Journal*.

"Section 2.—All papers, essays, photographs, diagrams, etc., presented in any section, shall become the property of the Association, to be published in the *Journal* of the Association or not, as determined by the Editor, and they shall not be otherwise published except with the consent of the author and of the Editor of the *Journal*.

"Section 3.—Each author of a paper read before any section shall, as soon as it has been read, hand it with any accompanying diagrams, photographs, etc., to the Secretary of the Section before which it has been presented. The Secretary shall endorse thereon the fact that it has been read in that Section, and shall then transmit it to the Editor of the *Journal*."

Attention to these matters, usually neglected, will ensure better meetings.

A.G.N.

The Canadian Rheumatic Disease Association

"Rheumatism", using this term in its widest connotation, is one of the greatest scourges of mankind. It has been known since the dawn of history and still takes an inordinate toll in death and disability. When we consider that rheumatism, acute and subacute, is common in childhood and lays then the seeds of further trouble in life, in the form of cardio-vascular disease, we can realize its importance. For cardio-vascular disease tops the list among the causes of death. There is in addition an economic side. Here we think of the cost of medical care and maintenance of the sick, the loss of time from work, the more or less permanent physical disabilities afflicting young people, the complications which arise in connection with Workmen's Compensation Board claims, and the costs to Sickness and Accident Insurance Companies. Clearly, we in Canada should do something about all this, for we also have our share of rheumatic disease. In Great Britain, continental Europe, and in the United States organizations have been formed during the past few years to deal with the situation, attacking the affection from the research as well as the clinical side. In Canada little has been done, except by a few enthusiastic medical men who have set up local clinics and are working against tremendous odds. However, we now see the dawn of a better day. A Canadian Rheumatic Disease Association has been formed,

and under favourable auspices. The history of its foundation is as follows.

In February of last year, in Ottawa, a small group of doctors and representatives of various organizations interested in the subject met informally and constituted themselves a Temporary Committee under the chairmanship of Dr. Ross Millar, with Dr. W. S. Barnhart as secretary. A questionnaire was sent out to leading medical men in Canada in which the following questions were asked: (a) Do you favour a comprehensive study of the problems associated with arthritis and allied conditions in Canada?; (b) Do you favour the plan recommended by the British Medical Association Committee on Arthritis?; (c) Do you favour forming a voluntary Canadian organization along the British Medical Association suggestions? An overwhelming majority returned an affirmative answer to all the questions and added some pertinent comments in regard to the urgent need for some such action. Accordingly, the Temporary Committee approached the Executive of the Canadian Medical Association, which body approved of the idea. It was suggested that the new organization might be set up as a branch of the International League against Rheumatism, which has its headquarters in Amsterdam, with some form of affiliation with the Canadian Medical Association. Eventually, it might be arranged that the new body would hold its annual meeting on the day preceding the opening meeting of the Canadian Medical Association. This arrangement is the one existing between the American Medical Association and the American Society for the Study and Control of Rheumatic Disease. A meeting for organization was held in Ottawa on February 14, 1936, an account of which can be found elsewhere in this issue of the *Journal* (see page 578). The Canadian Rheumatic Disease Association (this title may be changed, it is said) is now a reality and is proceeding to act vigorously under a definite plan. A constitution and by-laws have already been adopted.

We bespeak for the new Association a hearty and sympathetic reception. There can be no doubt that it is needed and medical men in general, and members of the Canadian Medical Association in particular, can do much to support it. A work of great social and economic importance is being inaugurated, and we should all be in it. The fee, for ordinary and associate members is only one dollar. The President is Dr. A. A. Fletcher, of Toronto; the Secretary, Dr. W. S. Barnhart, of Ottawa; and the Treasurer, Dr. J. Fenton Argue, of Ottawa.

A.G.N.

The "Canadian Hospital" Taken Over by the Canadian Hospital Council

Starting with the April issue, the *Canadian Hospital* which has for some years served the hospitals of Canada under private direction, was taken over by the Canadian Hospital Council and made its official publication. This young organization, which is now in its fifth year, has made excellent progress in effecting greater co-operation and coordination of activities among the hospitals and hospital associations in Canada, and the publication of this journal is now its latest development. The journal will be under the editorial direction of Mr. Leonard Shaw, B.S.C., the energetic and progressive superintendent of the Saskatoon City Hospital, who will be ably assisted by an editorial board composed of Mr. R. F. Armstrong, of Kingston; Dr. A. K. Haywood, of

Vancouver; Dr. S. R. D. Hewitt, of Saint John; Dr. J. C. Mackenzie, of Montreal; Mr. H. A. Rowland, of Toronto; Rev. Georges Verreault, of Ottawa; Dr. Harvey Agnew, of Toronto. Mr. C. E. Edwards, of Toronto, will continue as Business Manager, and Mr. A. J. Swanson, of Toronto, will be Chairman of the Publication Committee.

The journal will publish articles of interest to hospital administrators, trustees, nurses and the medical staffs, and contributions will appear in either English or French. Arrangements have been effected whereby, when time permits, synopses will appear following the article in the alternate language. We welcome this journal as the official publication of a closely allied national association, and wish it a very happy and successful future of service to the hospitals of this country. G.H.A.

Retrospect

PAPILLEDEMA AND OPTIC NEURITIS*

By LESLIE PATON, M.A., M.B., F.R.C.S.,

Consulting Ophthalmic Surgeon, St. Mary's Hospital, and Senior Ophthalmic Surgeon, National Hospital for Diseases of the Nervous System, Queen Square, London, Eng.

My first and most pleasant duty is to thank the American Medical Association, and especially its Section on Ophthalmology, for the very great compliment that the Council on Scientific Assembly has paid me in inviting me to be present on this occasion. I regard it as one of the greatest honours that have been paid to me during my ophthalmological life, and my only regret is for the inadequate way in which I can show my gratitude. The choice of a subject for an address has been a matter of great difficulty to me. Of recent years a good deal of my time has, of necessity, been given up to work with no definite scientific bearing; routine work connected with the councils and committees of various kinds which falls to one's lot as one gets older. Many of those who are somewhat senior know how this type of business more and more encroaches on the leisure which might

otherwise have been free for scientific or clinical research. It was the thought that I had nothing new or original to offer which made me hesitate for some time before accepting the invitation. I have, however, concluded that it may be of interest to the Section of Ophthalmology if I deal with a subject which more than any other has always been of interest to me—the conditions in the optic nerve and nerve head produced in certain disturbances of the central nervous system. I propose to deal with the subject primarily in a retrospective fashion.

I first went to the National Hospital for Diseases of the Nervous System, familiarly known to all neurologists as "Queen Square", as an assistant to Marcus Gunn in the year 1902. At that time Gowers, Ferrier, Horsley, Buzzard, Risien Russell and others were still actively working there. Hughlings Jackson was still a regular visitor to the wards and a source of inspiration to all his juniors. These were all very much my seniors. But I was specially lucky in the men who were more definitely my contemporaries as registrars, house physicians or pathologists. In my early years of work in the hospital and pathological laboratory, Farquhar Buzzard, Douglas Singer, Gordon Holmes, Kinrier Wilson, Barnes, Foster Kennedy, Godwin Greenfield and others who have since attained fame in the neurological world were among the house men with whom I was most closely associated.

In those days it was the custom to talk about optic neuritis simply, and the main distinction made was between a neuritis associated with changes in the disk and a neuritis affecting only the nerve behind the eye and not associated with obvious swelling of the disk (retro-

* Read before the Section on Ophthalmology at the Eighty-Sixth Annual Session of the American and Canadian Medical Associations, Atlantic City, N.J., June 12, 1935.

This article is also to be found in the *Archives of Ophthalmology*, 1936, 15: 1, in which publication ophthalmologists and others specially interested will find some additional illustrations. [Ed.]

bulbar). If the swelling in the disk was great it was called "*Stauungspapille*", or "choked disk", but that was regarded as only an exaggerated form of optic neuritis. There was no clear distinction between different forms of optic neuritis as it affected the nerve head, nor was there any too clear a distinction between different varieties of retrobulbar neuritis, except that it was recognized that one form was associated with disseminated sclerosis. But one did recognize that a definite distinction existed between neuroretinitis in which the disk was affected as part of a general retinitis and optic neuritis in which the retina was affected only by œdema spreading from the disk. I am only trying to recall the general atmosphere with regard to those subjects which existed in the early years of the century when I first began to take an interest in them. And yet already there existed in clinical studies the germ of ideas which led to a clearer knowledge of the nature of some of the changes. As early as 1865 Hughlings Jackson had called attention to the fact that so-called optic neuritis could exist without any loss of function, and in a lecture published in *The Medical Times and Gazette* of 1871 he recapitulated a numerous series of papers written in the preceding decade. It is from that lecture I quote: "For it is quite certain that there may be extensive changes of neuritis . . . when the patient does not know that there is anything the matter with his sight and when he can read the very smallest of our test types . . . Indeed optic neuritis may be altogether overlooked by those who do not use the ophthalmoscope by routine in cerebral cases, as the neuritis may retrocede" without defect of sight. In passing I may say that that particular lecture contains a very fine clinical picture of the optic nerve conditions in cerebral tumour, and it is well worth studying today.¹

Hughlings Jackson recognized definitely that a swelling of the disk could exist without loss of function. Here was a very definite signpost, a condition existing called "neuritis", and yet two of the cardinal signs of inflammation were lacking; there was no pain, and there was no loss of function. It was only later, when accurate observations were made, that it was found that the swelling of the disk was unassociated with any histological sign of inflammation other than swelling and venous turgescence. On the other hand, it was recognized that cases existed in which loss of function preceded any evidence of ophthalmoscopic change. In a few of these cases the condition subsequently progressed to optic atrophy, that is, a white atrophic-looking disk, even in cases in which seeming complete recovery of function took place. So there existed definite clinical evidence of two types. In 1908 Parsons intro-

duced into English from a paper by Elschnig the use of the term "papillœdema" to replace the term "*Stauungspapille*" for cases which showed more than 2 dioptries of swelling, while retaining the term "papillitis" for more moderate degrees of optic neuritis. And in 1911 Holmes and I adopted the term to describe all the cases of œdema of the nerve head due to raised intracranial pressure, and distinguished between papillœdema with no primary inflammatory changes and papillitis in which the swelling of the disk was associated with inflammatory changes and loss of function. True optic neuritis, as distinguished from papillœdema, was then regarded as manifesting itself in two ways, either as retrobulbar neuritis or, associated with disk changes, as papillitis, the only essential difference being in the site of the inflammatory change.

1. PAPILLŒDEMA

If in papillœdema there is no evidence of inflammatory change what, then, is the mechanism which gives rise to this œdema? I have seen no cause to modify in any serious way the hypothesis that Holmes and I promulgated in 1911. In brief, our statement was that the rise of the pressure in intracranial fluids was transmitted from the cisterna basalis along the optic nerve sheaths. In order to maintain the circulation in the intravaginal portion of the central vein against this raised sheath pressure there was a rise in venous pressure in the central vein and, in consequence, in the whole retinal circulation. This obvious venous engorgement resulted in increased formation of lymph. At the same time the main lymph channels draining the disk and posterior part of the retina pass back into the nerve sheath, and the increased sheath pressure blocks also the normal drainage of lymph. So the production of the œdema and swelling of the disk is due to these two factors—increased production of lymph from raised venous pressure and blocked drainage of lymph.

The optic disk may be regarded as a fibrous sponge formed by the interlacing of the fibres of the pars choroidalis running across and the nerve fibres running in. As the meshes between these fibres fill with the lymph unable to escape by its usual channels down into the nerve sheath, the fibres bulge out in every direction in which they can. In a case ten days after the first sign of swelling took place histological section showed that the strong fibres of the pars sclerotica of the lamina cribosa, which form the diaphragm between the two pressures, were unaffected by the œdema, but on the inside the fibres of the pars choroidalis began to show their forward convexity, and the lateral bundles of nerve fibres were beginning to bulge sideways. There was no evidence of any

inflammatory change. Visual function was good though the papilloedema was developing in a very rapid fashion. Nothing was visible histologically but a simple separating of the constituent fibres of the optic disk by fluid. It has to be remembered that in all these specimens the necessary preparation with fixatives reduces the actual swelling as seen in life, and in some cases must do so considerably.

If now one looks at a later more fully developed stage of papilloedema one can see all these changes more fully developed, though this section does not show the bulging of the pars choroidalis in such a diagrammatic form. It shows some features particularly well: the extreme lateral bulging of the outer bundles of nerve fibres and the consequent S-shaped course that they have to take to reach the retinal surface, the lifting up and folding of the retina and the consequent rupture of the connection between the external limiting membrane and the membrane of Bruch, the congestion of the central vein immediately inside the pars sclerotica and numerous small congested vessels. It shows also that the membrana limitans interna has been detached as it lay over the

central pit and has been bulged forward. Of course, this does not show in the prepared specimen, but you can see it lying wrinkled over the central pit. A higher magnification (Fig. 1B) shows the details of the lateral bulge more easily. It shows the portion torn away from the membrane of Bruch and the connection with the external limiting membrane, and it shows at one point a bundle of nerve fibres which have been held up by a loop of vessel.

The first appearance of any change in the edges of the disk is almost invariably at the upper and lower borders, and from there it spreads round the nasal margin, and often the outer margin may remain visible when all the others are completely blurred. The explanation of this is based on the normal arrangement of the nerve fibres. The fibres constituting the papillomacular bundle occupy about two-fifths of the circumference of the disk. The fibres going to the nasal half of the retina, governing much the largest visual field, occupy most of the nasal half. That leaves only approximately a tenth of the circumference of the disk for the whole of the rest of the fibres going to the temporal half of the retina. The result is a

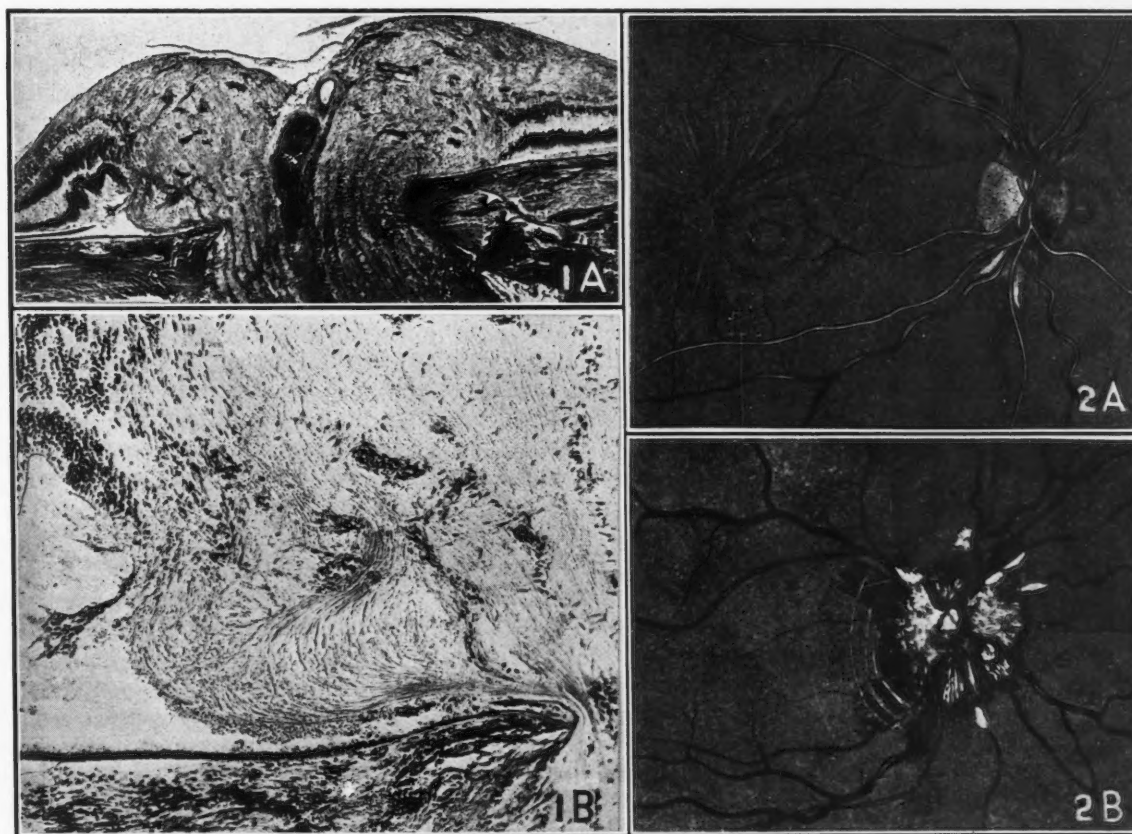


Fig. 1(A).—The forward and sideways bulging of the nerve fibres in the disk produced by the oedema. The membrana limitans interna has been lifted off the physiological pit by oedema (collapsed in preparation); **1(B)** the rupture of the communication between the membrana limitans interna and the membranes of Bruch produced by the lateral bulging of the nerve fibres. The illustration also shows the folding in the retina produced by the lateral bulging. **Fig. 2(A).**—Early stage of papilloedema with blurring of the upper and lower margins, the outer margin being still clear; **2(B)** hæmorrhages in intense papilloedema with white areas of swelling nerve fibres and retinal folds.

crowding together of the fibres above and below (Fig. 3), and when the œdema occurs the blurring will show first and most where the fibre layers are thickest.

The hæmorrhagic character varies greatly in different cases. In some cases, even with extreme swelling, there is little hæmorrhage. It is usually most marked in the nerve fibre layer, where it assumes a striate character. The other area of capillary distribution in the retina is the outer molecular layer, where the hæmorrhages, when they occur, are dusky and blot-like. Fig. 4 shows a clump of macrophages in

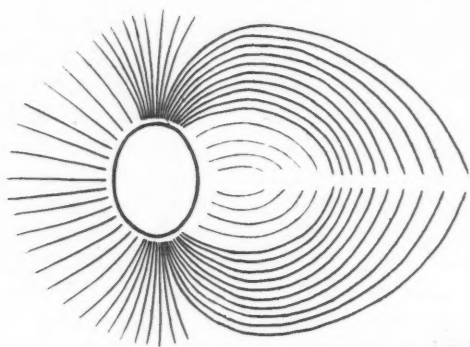


Fig. 3.—Diagram illustrating the crowding of the nerve fibres above and below the disk.

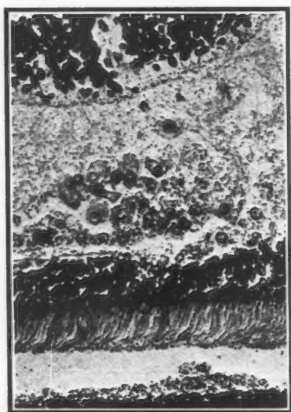


Fig. 4.—Cluster of macrophages at the site of an old hæmorrhage in the outer molecular layer.

the outer molecular layer, in what has been an old hæmorrhage. I have seen cases with small punctate hæmorrhages scattered all over the retina to the remotest periphery. In none of these cases did I get an opportunity to make a histological examination, so I am unable to give any explanation of these peculiar cases.

In describing the appearance of the so-called macular fan in cases of papillœdema in 1905 I gave my reasons for thinking that the bright spots that composed it were in the most superficial layers of the retina and were the result of an œdematous fluid overflowing from the disk and running under the membrana limitans interna. I showed that the presence of the macular fan was consistent with perfectly good

vision, but it was only in 1911 that Holmes and I were able to show histologically that this was the correct explanation and that the spots were the result of reflection from the bubble-like vesicles produced by rupture of the fibres of Müller and the raising up of the membrana limitans interna.

Normally, œdema spreading out along the nerve fibres of the retina is not in any way blocked or restricted but can flow out right to the periphery of the retina, except in the case of the papillomacular bundle; in the latter case its outflow is limited by the short course of these nerve fibres and further outflow can be accommodated only by forcing up the membrana limitans interna, and so one gets the familiar parabolic figure that is the usual result in cases of excessive œdema. In many cases, also, it is evident ophthalmoscopically that the membrana limitans interna over the surface of the disk and over the physiological pit is raised up by œdematous fluid. In course of preparation the membrane collapses, but in some cases it can be seen as a collapsed membrane over the pit, as in Fig. 1A. In high magnification the torn roots of the fibres of Müller can be seen adhering to the ruptured membrane in the vesicles. The œdema not only may rupture the internal membrane by pushing forward, but, as I have already said, it may rupture the membrane of Bruch and tear it away from its connection with the membrana limitans externa and push it sideways. This sideways swelling of the disk pushes the retina up into folds. These folds are often quite easily visible with the ophthalmoscope, and especially so when their presence is accentuated by hæmorrhages. It is obvious, therefore, that if the retina is shoved away from the edge of the disk in this fashion there will be quite a definite enlargement of the blind spot, and that the disturbance of the pigment layer which takes place at the same time will be obvious, even after complete subsidence of the swelling in the area round the edge of the disk.

The peculiar rounded or oval bodies known as "cytoid bodies" were first described as occurring in cases of albuminuric retinitis as long ago as 1856. Müller later rightly showed their association with the nerve fibres. They were found to occur in many other conditions apart from albuminuric retinitis, and Tepljaschin showed that wounds and injuries to the retina would always produce them. They are responsible for the soft white areas in the nerve fibre layer on the disk or in the adjacent retina. For years the nature of the cytoid bodies puzzled me greatly, but ultimately Holmes and I were able to show conclusively that they resulted from the swelling up of the cement substance of the nerve fibre and the subsequent disintegration of the fibrillæ composing the fibre.

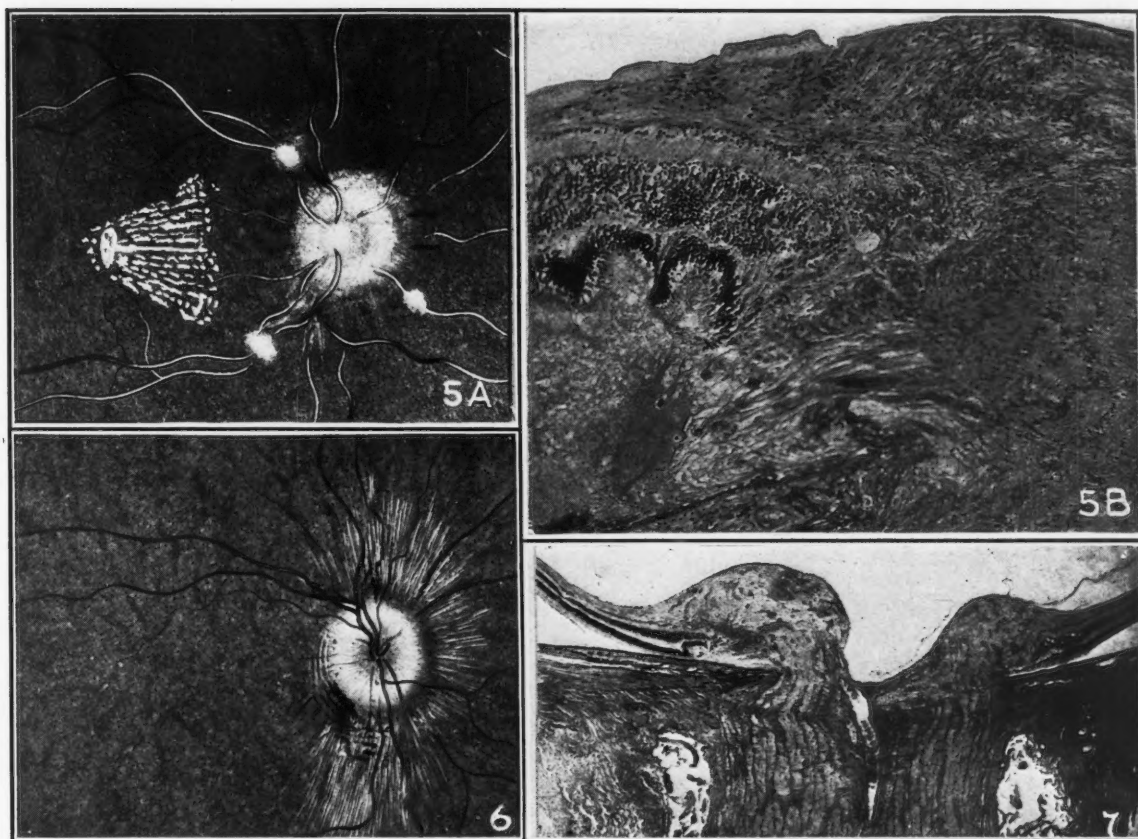


Fig. 5(A).—Older stage of papilloedema with macular fan and soft white areas of swollen nerve fibres near the disk; **5(B)** section illustrating the formation of the macular fan. The membrana limitans interna is raised up into the vesicles, showing ruptured fibres of Müller in the vesicles. **Fig. 6.**—Retinal foldings accentuated by hæmorrhages. **Fig. 7.**—A dense band of connective tissue may prevent development of swelling in one part of the disk, leaving the physiological pit clear.

The optic nerve is not a nerve at all but an outgrowth of the central nervous system. Embryologically, histologically and pathologically it behaves like the other conducting tissues of the central nervous system. Where it has a myelin sheath it suffers from the same diseases that other myelinated portions of the central nervous system suffer from. Inside the eye it only rarely retains any portion of a myelin sheath. The reaction of its fibres to injury consists of a swelling up of the interfibrillar cement substance and a subsequent breaking up of the fibrils themselves.

On the occasion of my reading a paper entitled "Optic neuritis in cerebral tumours" in 1908 a considerable controversy was created by my statement that the statistics of my cases did not bear out the belief that a difference in the amount of swellings is of value as indicating the side of the brain on which the tumour is likely to be found. My subsequent experience of many years and many hundreds of cases only further confirms me in this belief. I should go further now and say that the percentage of cases in which there is any measurable difference in the amount of papilloedema in the two eyes is much lower than I then thought. In by far the

greater number of cases the swelling, when it is at its height, is nearly equal in the two eyes, and when one considers the mechanism by which it is thought the papilloedema is produced one can see that this is the more probable condition: there is a general rise of pressure in the fluids in the skull, and pressure in a fluid is transmitted equally in all directions. Now if both optic foramina are equally open equal pressure will be transmitted from the cisterna basalis into the sheaths of both nerves and will give rise to equal obstruction of the venous return and lymph drainage from the disk, and so, normally, to equal appearances in the disk, and the swelling of the tissues of the disk will go on until the stretching of these tissues is such as to compensate for the increased pressure of fluid in the tissues. Now, Walter Parker has shown, in a paper published in 1916, that one of the factors which may cause an inequality of swelling in the two disks is an inequality in the intra-ocular tension, and that the eye with the lower intra-ocular tension will show swelling of the disk sooner than the other. A further factor may be some difference in the tissue construction of the disk, and Fig. 7 demonstrates that the presence of a denser band of connective

tissue at one part of the disk prevented the appearance of any swelling at that point. In this case, though the nasal half of the disk was swollen to the height of 4.5 dioptries, the outer half of the disk remained free from swelling. This particular illustration shows only how a density of connective tissue may prevent swelling at one part of the disk. But a difference in general tissue construction of the two disks may account for some of the cases of difference in the amount of swelling.

In a paper which I read in 1905 and in subsequent papers I spoke of the temporary attacks of amaurosis lasting from half a minute to an hour or more which occasionally occurred in cases of increased intracranial pressure, and I showed grounds for believing that these were not associated with the papilloedema but might occur quite independently of disk changes, and that the probable cause was a temporary increase of pressure on the chiasma or intracranial portions of the optic nerves. In a subsequent paper, published in 1908, I adduced a series of cases—three frontal and one temporosphenoidal—in which the amaurosis was one-sided and on the side of the tumour. In these cases of amaurosis the raised pressure was intermittent, and the phenomenon was accompanied by other signs of temporary increase of intracranial pressure, such as increased headache and giddiness. I went on to say that if there was direct pressure on the nerve itself the result was "optic atrophy" and not "optic neuritis". (In 1908 that term was still being used.) At the end of 1908 I had a post-mortem opportunity of confirming my belief that a tumour at the anterior end of the temporosphenoidal lobe or on the under surface of the frontal lobe would cause atrophy of the collateral nerve and papilloedema on the opposite side. This case is of some historical interest since it formed the subject of the last public lecture that Sir William Gowers gave, and I may quote the short description of the chiasma and nerves of that case. "The tumour lay above them and compressing them and it had pressed back the optic chiasma. The left nerve had evidently suffered more compression than the right. There was no distension of the sheath of the left nerve, but moderate distension of the right sheath just behind the eye-ball. The left optic nerve had evidently suffered longer and greater compression than the right." I may add to Gowers' description that the tumour had blocked the left optic foramen. My examination of these nerves showed that the seat of degeneration in the left optic nerve occurred in the very short piece of the nerve between the chiasma and the optic foramen. This was stretched because the optic chiasma was being pushed backward by the growth. The largest patch of degeneration occupied the outer part of the nerve, the position which is

occupied by the macular fibres in the intracranial portion of the nerve. Gowers, in his lecture, said: "Any case which presents this condition" (*i.e.*, atrophy in one eye and papilloedema in the other) "will probably warrant the same diagnosis." In his own words: "You may assume that the optic neuritis produced by an ordinary intracranial tumour is always produced in both eyes." He quotes the one exception: "In this the mononuclear neuritis from cerebral disease having the symptoms of a tumour was confined to the right eye, but . . . the left was artificial!"

This thesis was developed at greater length by Foster Kennedy.² In rare cases, the appearance of optic atrophy in one eye and papilloedema in the other has proved a very valuable indication of the location of the tumour either in the anterior end of the temporosphenoidal lobe or in the base of the frontal lobe on the side collateral with the atrophy.

2. OPTIC NEURITIS

The second part of my subject, true optic neuritis, is much more difficult to deal with in a brief fashion, and I propose to limit myself mainly to the types which I have met with in a neurological clinic. By doing so I leave untouched cases in which the optic nerve is affected by local orbital infections or by septic conditions in the adjoining accessory sinuses, etc. I omit also syphilitic, tuberculous and rheumatic involvements about the apex of the orbit. On the big subject of tabetic atrophy I wish only to reiterate what I said in 1922 when I concluded from a careful examination of the visual fields and the variability in the type of visual loss that the attack on the nerve might in some cases be interstitial and in other cases parenchymatous.³ In other words the optic nerve sometimes reacts like the posterior spinal roots in tabes and sometimes like the cerebrum in dementia paralytica.

In what remains of my time I shall speak of the obscure class of diseases in which a neurotropic virus attacks the optic nerves. Unfortunately, the identity of the virus in most cases is not clear; and until methods of separating and identifying the viruses have been arrived at, there will always remain a doubt as to whether clinical cases which seem to differ from one another may not owe their differences to a variation in the virulence of the poison or in the susceptibility of the tissues affected. Herpes ophthalmicus is one of the virus diseases which does rarely attack the optic nerve on the affected side and may cause blindness. There still exists a doubt as to whether herpes zoster and herpes febrilis are due to the same or to different viruses. On the other hand, in my own mind there is little doubt that the virus of herpes zoster is closely allied to varicella, and, if so,

also to vaccinia. I have seen many cases of the close association of chicken-pox and zoster, the one a dermatropic and the other a neurotropic manifestation of the virus. I am ashamed to say that when I first came across optic neuritis associated with herpes ophthalmicus I regarded it as an undescribed complication. It is certainly a rare one, but Jonathan Hutchison described a case in 1866, and at intervals since then cases have been recorded. In 1923 I had two cases within a few months of each other, both resulting in blindness in the affected eye.⁴ The association of herpes with chicken-pox is of interest, however, from another aspect. The only case of acute disseminated encephalomyelitis which I have seen followed an attack of chicken-pox, and seemingly most of the reported cases of this condition follow varicella, vaccinia or measles. But disseminated encephalomyelitis is only one of the four virus infections in which optic neuritis is a definite and predominant symptom, and it is still in doubt as to whether one is justified in treating the disorder as other than a clinical variety of disseminated sclerosis. It is all so speculative at present, this question of the interrelationship of all the virus diseases. It almost seems as if in the future the differences will resolve themselves as the differences in the atoms have resolved themselves into variations in the relationships of protons and electrons and these in their turn to radiations of varying wavelength.

The common feature of the four virus infections of which I speak is their liability to attack the optic nerve in the early acute stage of their incidence, and the fact that the first tissue to be attacked is the myelin sheath, whether it is in the optic nerve, in the centrum ovale or the tracts of the spinal cord. The prototype of the class is (1) disseminated sclerosis with all its protean clinical manifestations and varied course. The other three types are (2) acute disseminated encephalomyelitis; (3) acute ascending myelitis, neuromyelitis optica of the French, or Devic's disease; and (4) diffuse periaxial encephalitis, or Schilder's disease. These are all definitely demyelinating diseases, and in consequence the optic neuritis is of the retrobulbar type, with characteristic pain and loss of function, but if the site of the lesion is forward in the nerve, in front of the point of entry of the central vessels, there will be a blockage of venous and lymph return from the disk and consequent oedema of the disk. I believe a slight degree of this oedema is much commoner than is suspected. In some cases the swelling and hæmorrhage of the papilla are so marked as to give rise to mistakes in diagnosis, and not infrequently disseminated sclerosis has been diagnosed as cerebral tumour because of the presence of swollen disks with hæmorrhages. In

1914 I wrote a paper on this subject⁵ in which I gave four main differentiating points:

1. The loss of sight precedes the ophthalmoscopic changes.
2. The ophthalmoscopic changes are of very brief duration.
3. The disks may show no trace of change after the swelling has subsided.
4. The recovery of vision is usually synchronous with the subsidence of the swelling.

While it is true that the disk may show little trace when the swelling subsides, later on the whiteness of the disk may be extreme. During the International Congress of Ophthalmology of 1913 in London I remember showing many of the distinguished visitors a case in which the disks were absolutely opaque white, yet vision was 6/5 in each eye and the visual fields were full. Careful perimetric examination in such cases, however, often shows small patches of relative scotoma paracentrally. They are usually close to the fixation point, and it requires very careful scotometry to discover them. So much has been written and said about the ophthalmological signs of disseminated sclerosis that I shall not spend any more time over it now.

I have already spoken of my only case of acute disseminated encephalitis which, as I have said, followed on, if it did not result from an acute attack of chicken-pox.

The cases in the acute ascending myelitis group are so dramatic in their incidence and their clinical course that, whatever the nature of the infection is, they merit a place by themselves. Gilbert Beck⁶ gives a very full description with the report of the post-mortem examination of a case which I had under observation at Queen Square. In this case there was a first attack with recovery, then a recurrence a year later, when the girl died. I did not see her at the time of the first attack, and it was only on the recurrence a year later that I saw the disks. At that time they were dead-white with clear-cut edges and showed little evidence of a pre-existing neuritis. Vision in the left eye was equal only to perception of hand movements, and that in the right eye, to reading large letters at 1 yard (about 91 cm.), and there were large central scotomata.

I have been fortunate in being able to keep in touch with two patients whom I saw when the condition was acute and in whom the recovery has been as seemingly complete as the onset was dramatic. The picture presented is that of a rapidly developing blindness, beginning as a central scotoma and gradually spreading into the peripheral fields until vision was completely lost; there are the characteristic pupillary reactions, the slight but definite papillitis, and associated with that a rapidly ascending myelitis, until the patient lies like a log

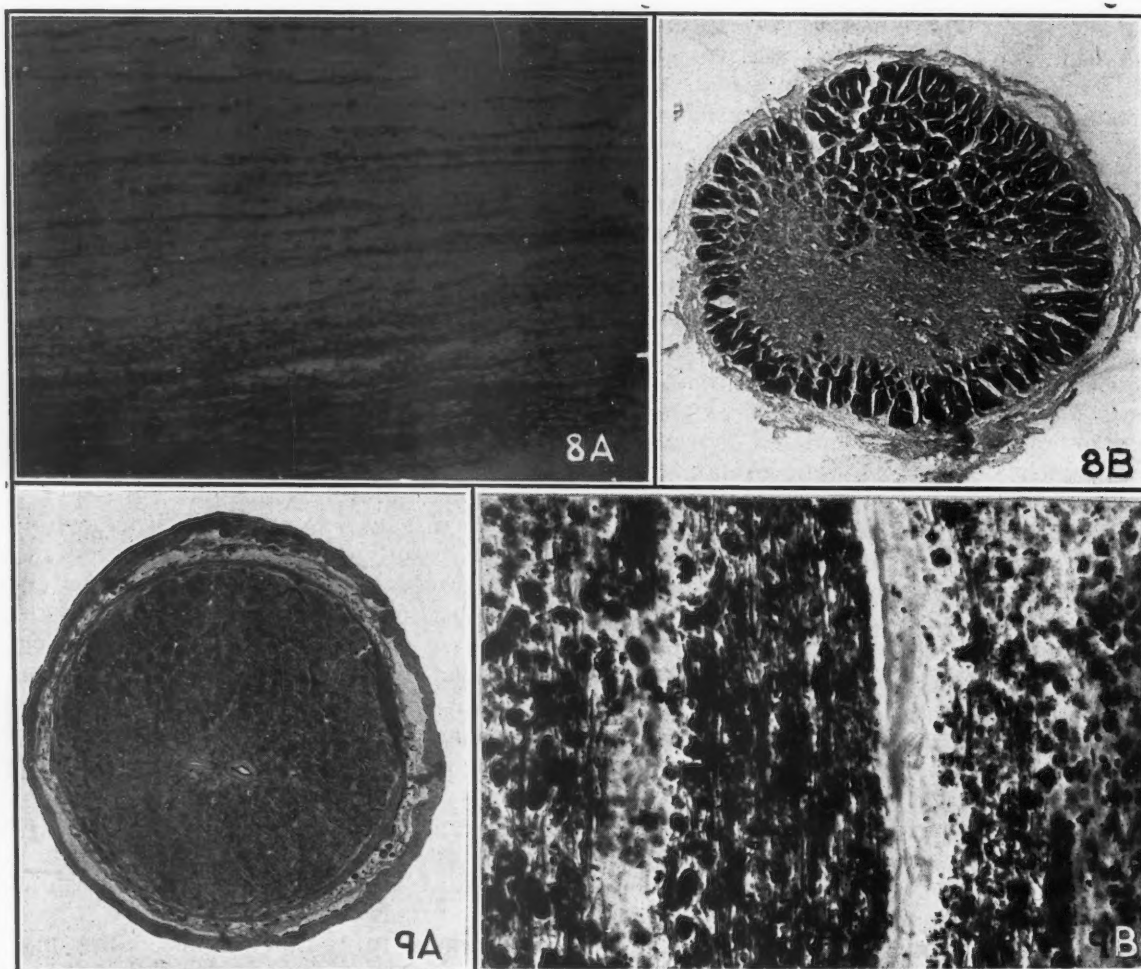


Fig. 8(A).—Longitudinal section of the optic nerve in a recent case of neuromyelitis optica (Devic's disease), showing demyelination of the fibres; **8(B)** a cross-section of the optic nerve in a case four years after the occurrence of the inflammation, showing a large patch of demyelinated fibres. There was a large central scotoma during life. **Fig. 9(A).**—Cross-section of the optic nerve in a case of diffuse periaxial encephalitis (Schilder's disease); **9(B)** longitudinal section of a nerve in the same case, showing the breaking up and loss of the myelin sheaths.

and life is maintained only because the phrenic nerve is unaffected and so the diaphragm can act and maintain breath in the body. The possibility of recovery is so complete that, except for a whiteness of the optic disks, it is almost impossible to say that anything has ever been wrong. One of the patients was the Sister in charge of the isolation ward at St. Mary's. The spinal cord was affected up to the level of the neck, all the inter-costal muscles were paralyzed, and she lived only because the phrenic nerve was unaffected. She was completely blind and had a small degree of swelling in both disks. That is many years ago. She is now alive and well, is married and has three children, and has led an active life. In the other patient under my care in 1910 the optic neuritis was associated with a higher degree of swelling of a hæmorrhagic character, but again the recovery has been complete and lasting.

Beck gives his grounds for differentiating such cases pathologically from those of acute disseminated sclerosis, as I certainly should be

inclined to differentiate them clinically, and he inclines to associate the condition more closely with Schilder's disease.

Of all these degenerating forms of optic neuritis I think Schilder's disease, or encephalitis periaxialis diffusa, must be recognized as a distinct entity. While the boundaries between most of the other forms of demyelinating disease are obscure and doubtful, and while it is open to argument that they are all only variants of disseminated sclerosis, differing only in the severity or extent of attack, Schilder's disease, both clinically and pathologically, can be distinguished. Rather more than one-third of the cases show optic neuritis. In others there are disturbances of vision without any evidence of optic neuritis, and that is not a matter for surprise when one realizes that the essential lesion is a degeneration of the white matter in the centrum ovale and most frequently seen in its most developed form in the occipital lobes. The case of which I have a record was peculiar in the rapidity of its course.

The patient was a widow, aged 43. She was stated to be well on the morning of June 10, 1925. In the afternoon the sight of the right eye was affected. On the morning of June 12th she was nearly blind in both eyes, and in the afternoon she was admitted to the National Hospital for Nervous Diseases under Dr. Grainger Stewart. On June 13th, with the right eye, she could distinguish hand movements only, and vision in the left eye was 6/60. There were no fundus changes visible. On June 15th she was completely blind. My examination that day showed that both disks were hyperæmic, with blurring of the edges and a swelling of approximately 1 dioptre. The veins in the lower half of the retina in both eyes were considerably distended. The condition was true optic neuritis with papillitis, not papilloedema. She died on June 18th. Examination post mortem showed that the most important lesions were the large patches of degeneration in the white matter of the occipital lobe surrounding the cap of the calcarine fissure. This degeneration probably played the most important part in the visual disturbance, but the complete absence of any reaction of the pupil to light in the latter days of life showed that the optic neuritis had also interfered with nerve conduction.

A very full review of these demyelinating diseases has been made by Milton L. Berliner.⁷

Another class of virus diseases attacking the central nervous system which also is of interest to ophthalmologists is that of which epidemic encephalitis is the prototype. It seems, however, as a rule not to be associated with either papilloedema or optic neuritis, though ophthalmoplegic complications are characteristic. I have no experience of the Japanese variety or of the variety that was observed in the St. Louis epidemic, but I believe I saw almost the first case of the 1917 epidemic that occurred in England. I believe that sporadic cases had occurred for years before this and were ascribed to other causes, such as botulism, lead poisoning or alcoholism. I have really no excuse for dwelling further on this subject, but from the point of view of historic interest I should like to refer to a case simply because it is mentioned in the last paper published by

Hughlings Jackson, in the writing of which I had the honour to be associated with him.⁸ In that paper we spoke of the case as one of polio-encephalitis superior hæmorrhagica of Wernicke, but even at that time we were in doubt as to the diagnosis, as there was no history of alcoholism. My subsequent experience of encephalitis has led me to believe that we really were dealing with an early sporadic case of the von Economo type.

COMMENT

Throughout the whole of this lecture I have been definitely egotistical. I have not been writing a general review of the subject. I have been giving only a retrospect of parts of a huge subject which have come specially under my notice, points which have specially interested me in the last thirty-three years. How different it may all seem to the new generation who will review it in another thirty-three years, as different as the atom of Einstein and Niels Bohr and Eddington is from the atom of Kelvin and Clerk Maxwell. Ophthalmologists of the younger generation will have all sorts of resources of new knowledge to apply to the solution of these problems, and to some it will be given to arrive at a generalization and a simplification that will clear up much which is, at present, obscure and doubtful.

REFERENCES

1. TAYLOR, J.: Selected Writings of John Hughlings Jackson, London, Hodder & Stoughton, Ltd., 1932, 2: 251.
2. KENNEDY, F.: Retrobulbar neuritis as an exact diagnostic sign of certain tumours and abscesses in the frontal lobes, *Am. J. M. Sc.*, 1911, 142: 355.
3. PATON, L.: Tabes and optic atrophy, *Brit. J. Ophth.*, 1922, 6: 289.
4. PATON, L.: *Proc. Roy. Soc. Med. (sect. ophth.)*, 1923, 16: 27.
5. PATON, L.: *Trans. Ophth. Soc. U. Kingdom*, 1914, 34: 252.
6. BECK, G. M.: *Brain*, 1927, 50: 687.
7. BERLINER, M. L.: Acute optic neuritis in demyelinating diseases of the nervous system, *Arch. Ophth.*, 1935, 13: 83.
8. JACKSON, J. H. AND PATON, L.: *The Lancet*, 1909, 1: 900.

THE URINE IN BENZENE POISONING.—W. P. Yant *et al.*, as the result of the analysis of urine specimens from dogs subjected to a variety of conditions of exposure to benzene vapour in air, found that a rapid and marked decrease occurred in the percentage of inorganic sulphates of the total sulphates, and they recommend testing of the urine in this way in all cases of suspected industrial benzene poisoning. The determination of sulphates is a relatively simple and accurate chemical procedure. If the urine specimen is collected at the end of the day's work, it furnishes a means for ascertaining the overall daily exposure, which is especially desirable in dealing with situations in which a person might be exposed to widely varying concentrations for indefinite periods during his work. The authors do not consider that this test should be used to prove exposure to benzene, because the extent to which other agents or physiological or pathological

conditions may affect the sulphate response has not yet been determined. The mechanism of this response is believed to be due to oxidation of the benzene to phenol or phenolic derivatives, which in turn are conjugated in the liver with sulphate ions to form ethereal sulphates, thereby causing a shift to the right in the system "inorganic sulphates to or from conjugated sulphates." The shift or decrease in inorganic sulphates is related quantitatively to the severity of the exposure to the point of complete elimination of the inorganic sulphates. A distinct decrease in the percentage of inorganic of total sulphates occurred with conditions of exposure to benzene which did not produce anæmia or leukæmia. With conditions which caused benzene poisoning a notable decrease in sulphates occurred many weeks before any clinical evidence was obtainable.—*J. Indust. Hyg. & Toxicol.*, January, 1936, p. 69. Abs. in *Brit. M. J.*

Men and Books

ANSON BUCK
M.D., M.R.C.S. (ENG.),
1833 - 1919

A SKETCH BY

S. H. CORRIGAN, M.D.,
Lampman, Sask.

I shall tell you of one who was born a century ago, and of a brave people who chose to be loyal to their king, who followed their own flag through suffering, loss and death, and, when their arms failed, disdaining the revolutionary banner, carried their torch to strange and comfortless forest lands, there to begin anew, content so long as the flag they loved waved over them.

History records that the first settlers of Upper Canada were women and children. They are not unknown or unsung by their descendants of the present generation. In the earliest histories of the Loyalists (Canniff's and Ryerson's, and later narratives) their names recur as follows: "Mrs. Nelles, Mrs. Secord, Mrs. Bowman, Mrs. Buck and Mrs. Young, and their thirty-two children."

Their able-bodied menfolk were either serving in the Loyalist armies or were prisoners of the revolting forces. Their homes were raided. They lost all. Mrs. Bowman's baby was not a week old and a blanket was mercifully left with her. History records, "that they had but one pair of shoes between them!" It was November. Hungry and freezing, they were wandering in the wilderness. They had come to the valley of the Mohawk, New York, seeking shelter under the British flag. The Commander of the forces at Fort George (Niagara), learning of their need, sent a detachment of soldiers and Indian guides, and brought them into the fort. Later they were sent to Quebec for protection, and on the trail at Lachine, near Montreal, was born Philip Buck II, the father of our Dr. Anson Buck.

After the war they returned to the Niagara Peninsula and drew lots for their land. Here they were joined by their husbands, some of whom trekked over a wilderness in search of them. The Bucks' original household lay near Fort Erie. The five American-born children were added to until there were a full dozen.

Of Governor Simcoe's two military roads, built out of York, Upper Canada, the one running west as far as London was called Dundas Street. Twenty-five miles west of Toronto, in

what is now Halton County, there flows into Lake Ontario at Oakville the Sixteen Mile Creek. Where this stream crosses Dundas Street there was excellent water power, and there grew up, one hundred and twenty-five years ago, the largest settlement between Toronto and Hamilton. Here were lumber, flour and woollen mills, tannery and blacksmith shops. Today there is nothing to show that one time there existed here an industrial centre of more than three hundred souls. In this town one George Chalmers, a member of parliament of Upper Canada, engaged in business. In his store worked a Scottish youth, who, in his late "teens", removed to Toronto, studied law, and became Solicitor General in John Sandfield MacDonald's government, later an eminent jurist. This was Sir Adam Wilson. The first settler here was one Lawrence Hager. He named the place Hagertown. It was also known as Proudfoot Hollow, and at times as the Sixteen Hollow. Later it became Palermo, and so remains today, though two miles further west on Dundas Street.

Among the early settlers from the United States who came in 1812 were the Howells. Most of the land between the "Sixteen" and Palermo of today was owned by the Bucks, Howells and Smiths. The old residence of Sampson Howell and his son John T. Howell, (who was Dr. Buck's father-in-law) still stands at the west end of the bridge overlooking the valley. It was built in 1834.

Near the banks of the "Sixteen", in 1832, came one from Scotland, Dr. James Cobban, M.R.C.S., the earliest resident medical practitioner in that district. His white frame house still stands, also, south of Dundas Street. It is believed that to Dr. Cobban's influence the local historic names of Nelson, Trafalgar, Bronte, and Palermo are attributable. It is said he had visited Sicily and other Mediterranean places before settling in Canada. Doctor Cobban later removed to Milton, the county town (see sketch on Clarkson Freeman, this *Journal*, 1930, 23: 438. Of four grammar schools the first established in Upper Canada one was at Palermo. As the master was one Andrew Hall, of Glasgow University, the classics came to this place in the forest. Among the Loyalist families settling in the vicinity were the Bucks, Smiths, Mullhollands, Posts, Freemans, Biggars and Hagers.

In the year 1833 was born to Philip Buck and his wife, Juliana Boehm, a son—Anson Buck—the subject of this sketch. Toronto, a town of ten thousand people, was incorporated a city one year after Anson Buck's birth. One hun-

dred years ago Halton County was but little changed from primeval conditions. The boy grew up in contact with all the beauties, the mysteries, the advantages and disadvantages of pioneer life in the forest. Among his many duties was protecting the domestic animals of his father's farm. He knew that the wolf was ever near to take toll of the sheep. Without the sheep's wool there was no clothing for the family. Ever the black bear was not far away—a standing menace to the domestic supply of ham and bacon. Even the wild deer loved the fresh green of the tiny grain fields, and these had to be protected, for there must be meal and flour. Ever alert, ever cautious, he developed powers of observation, of patience and judgment that served him well throughout life. None knew or loved the hidden things of the forest better than he—all the plant life, the birds, and furry animals became his friends. Never did he lose this love and interest in his woodland studies.

One day the boy was missing. At evening he returned riding one of the farm horses. He had been to Hamilton, sixteen miles distant. Proudly he showed some school books he had purchased with his savings. There were the grammars, Latin and Greek, Homer's *Iliad* and *Odyssey*, and Virgil's *Æneid*, also a work on Physical Science. To this day these books, with many others, are sacred treasures in the keeping of his surviving daughter.

Of this dark haired, eager-faced boy, with a thirst for knowledge, and a master teacher as guide, one may catch glimpses. Could he not master the declensions and watch the sheep too? All nouns were not to be found in the grammars. There must be Latin and Greek names for his forest friends. What joy to search for and place these in his vocabulary! In the winter time may we not see him in the yellow candle light? There he lay on the floor, reading the *Odyssey* by the light from the blazing logs in the open fireplace. How his face set as he sailed between Charybdis and Scylla! How he held his breath when Polyphemus hurled a fragment of the mountain at Odysseus' ship! Did he not sigh relief when, after an eternity of trial, Odysseus floated into the river mouth and lay exhausted on the sands of his beloved Ithaca? The maple logs crackle and glow. The family, as true pioneers, sit around, each with some special task in hand. Outside the wind moans through the tall pines. The new snow drifts against the small square window panes of the colonial house. Wonder not that out of such Canadian homes came great physicians more than eighty years ago.

Now I shall tell you a tale, clear of all myth. You may question the truth of my statements, but proof I shall furnish. The Scottish teacher, having done his work well, as all good Scots

incline to do, his pupil, Anson Buck, sixteen years of age, registered in the fall of 1849 as a student in the Rolph School of Medicine at Toronto. Having completed in that excellent early medical school two winter sessions and one summer session, he proceeded in the autumn of 1851 to Jefferson College, Philadelphia, where on the 6th day of March, 1852, he won his M.D. In October of the same year



Dr. Anson Buck, at 73 years, with his grandson, Colin Howell Campbell, at 3 years.

he went to Philadelphia, sailed to London, and registered to study at Guy's Hospital. In March, 1853, on examination, he was made a Member of the Royal College of Surgeons of England. Thus he returned to his own Palermo, this child of the forest, schooled in mathematics and physical science, learned also in the ancient classics; with his M.D. from a School of Medicine which from its beginning was, and to this day is, among the best in America; with membership in a surgical examining body, the most august and exclusive in all the world. This boy, three months less than twenty years of age, opened his office for practice one mile from where he was born. One year later came to him the greatest of all blessings. He married his boyhood sweetheart, Keturah Howell. Together in their beautiful Palermo they lived and served the sick and injured, far into the long shadow land. The loving wife and mother went to rest in the year 1906.

If the reader be skeptical, there is abundant local record to prove the dates I have given for

Anson Buck's birth. Remembering that it has long been customary to require of a candidate for the Doctorate in Medicine and for license to practice medicine that he be of the full age of twenty-one years, proof must be provided for my statements. In my file are three letters of recent date. The Dean of Jefferson College has written to state that Anson Buck received the M.D. in that College in March, 1852, and that he died in Toronto in April, 1919. Dr. H. Wilberforce Aikins, Registrar of the Ontario College of Physicians and Surgeons, states that Doctor Buck was registered with the Provincial Licensing Body the year it was instituted, 1866; that he presented credentials from Jefferson and from the Royal College of Surgeons of England, bearing the dates as stated. In a letter from Horace H. Rew, Secretary of the Examining Board of England for the Royal College of Surgeons of England, I am advised that Anson Buck became a member of the latter College in the year 1853; that having received this degree he must have been of the full age of twenty-one years. It is certain our young doctor, passively or actively, misinformed the Secretary of the Royal College in the matter of his age, but I feel sure the recording angel, as often before, immediately blotted out his own record, not with tears of sorrow, as it has on other occasions been reported, but through sheer amazement and joy flowed the obliterating lachrymal secretion. Certain it is that in his long years of toil among the suffering, any single one of his countless acts of kindness would easily atone for such violation of law, terrestrial or celestial. I digress to express wonder why the age limit was ever imposed. Why it is still maintained in this day of long and expensive course of medical study? Why may not clever students progress on merit rather than on chronological measure?

Among many interesting records and papers entrusted to me at this time by Anson Buck's daughter are two which I must mention. As a student at Toronto, in the "nineties", I learned to revere the memory of three of the earliest teachers of medicine in Upper Canada. In the little college where I was trained hung three portraits—those of Dr. Bovell, early preceptor of our immortal Osler; and of Dr. Hodder, who was first to do intravenous transfusion of cow's milk in cases of severe hæmorrhage. These two men founded in 1850 the Upper Canada School of Medicine, which in the same year became the Medical Faculty of the newly chartered Trinity University. The other portrait was that of Doctor John Rolph, founder of the Rolph School of Medicine.

It would appear that Anson Buck, having his Jefferson degree and that of the Royal College, and not having been required to hold a Canadian university degree, later decided to obtain one. Accordingly he entered for examination the

University of Victoria College, 1861. One of the two papers I have mentioned is a letter from Doctor Rolph. Herewith I quote it in full:

Toronto, May 28, 1861.

"My dear Doctor, the University of Victoria College has conferred on you the Degree of M.D. Accept my congratulations. It is necessary for you to transmit the graduating fee to President Nelles, unless you prefer sending it through me. The fee is \$30.00. I am, my dear Doctor,"

Yours faithfully,
(signed) John Rolph,

To: Anson Buck, Esq., M.D.

It is hardly possible there lives today any one who studied medicine under the kindly guidance of Dr. John Rolph, who died in 1870.

The other precious document is a license certificate printed and written on parchment in the year 1853. It was issued by command of Lord Elgin, "Governor General of British North America, Captain General and Governor-in-chief, in and over the Provinces of Canada, Nova Scotia, New Brunswick and the Island of Prince Edward, and Vice-Admiral of the same." It is countersigned by A. N. Morin, Secretary, "reposing confidence in the loyalty, integrity and good morals of Anson Buck, of Trafalgar, Esquire, Surgeon, do hereby license the said Anson Buck to practise Physic, Surgery and Midwifery in the Province of Canada called Upper Canada." It was given March 18th, 1853, at the City of Quebec, at that time the capital of the United Provinces of Upper and Lower Canada.

The parchment is excellently preserved. On the reverse of the parchment, in a space for such purpose, it is stated that record of the document will be found in Book B, Folio 56, and the fee received—20 shillings. This is initialed P.D.H., some forgotten clerk of Provincial records. No such document as this was issued in Ontario subsequent to the year 1866. There may be many such extant. I have not seen other than the one in hand, though there must have been two among people of my own kin. I hope some copies are preserved by our medical organizations. Incidentally, how many of our young men, even our school teachers today, have ready knowledge of Augustine Norbert Morin, whose name appears as Secretary? How many could state that he was an important member of that small group of moderates who paved through troublesome times the way to peaceful union of our fair Provinces in 1867—that he was Secretary of State in Sir Francis Hincks' Government? Even so, in matters medical are records of national incidents preserved.

With the advent of steam power the poetry of water wheels on the "Sixteen Mile Creek" fell into silence. While industries sprang up in Palermo with the clearing of the land and the production of grain, a foundry was established for the manufacture of agricultural implements

there, and one of the earliest carriage works in Upper Canada. In 1875 Doctor Buck built his beautiful large residence. The village, as I recall it in my childhood, was a busy place. From the day Doctor Buck opened his office, patients came in increasing numbers. His special ability in diagnosis, his aptness in surgical work, soon brought to him many calls to consultation among other practitioners of the county. Small town hospitals were unheard of then, and of trained nurses there were none, but he trained the country women so that each community had some experienced nurse, and in desperate cases he stood guard, sparing neither himself nor his time, occasionally bringing to his home some slow convalescent. In general practice he developed special ability in treating the various types of talipes. Patients came to him from outlying fields, even from the State of New York. Among papers before me is a letter from a thankful mother whose crippled child's limb had been greatly improved by the young surgeon's treatment.

His work growing in volume, he early took a partner and was never without one—this at a village where the railroad never came, and only a short distance from other medical men. He kept horses of the best type; as many as ten were in his stable. Often he rode horseback, but found the buckboard best suited to the heavy roads, and in later years he used the "top buggy". The pioneer roads were difficult, mostly flat roads of heavy clay, crossing numerous little valleys, where in springtime after each rain the wooden bridges were never too secure. Often a stable boy would go out to meet the Doctor at intersecting roads, that he might have fresh horses before the long day's round of visits was complete. Young men in rural practice today, caring for surgical and maternity patients in little hospitals, having automobiles and telephone service, cannot know what men like Doctor Buck endured in the rural practice of his time. Often, as a child and youth, I met him on the highway. There was always a cheery greeting. Sometimes he would stop for a few words. He loved to propose a new "riddle" and, as he waited for the solution, would gather his reins and whip, and with his merriest manner give us the answer and drive quickly away.

The Palermo country was a land of large families. Six to ten or twelve children was no surprising group in one home. One heard everywhere of the love of mothers and children for Doctor Buck. Thousands of children came into the world under his kindly and skilful care. Along the shore of Lake Ontario, but four miles' distance, was Bronte Village. There families of refugee slaves settled from the Southern States of pre-abolition days. Even the least among these people received his kindly skilful care. To this day the coloured people there revere his

memory. Never, perhaps, was a man more resourceful in emergency. Once, when called to Bronte to care for a sailor who suffered a destructive fracture of the skull, he found so much detached bone that a protective plate seemed necessary. The Doctor, going to the blacksmith's anvil, hammered a silver coin to the desired size and thickness and anchored it in place. The patient recovered and returned to work. The Bronte boys, ever keen to earn a penny, gathered leeches and offered them for sale, calling their catches to the Doctor as he drove by. Among medical men of his age in the nearby Toronto community, with whom he consulted and who were his personal friends, were the earlier physicians of the Aikins family and the late J. Algernon Temple. Not infrequently in my student days I heard my teachers make kindly mention of Anson Buck's work.

Dr. Buck had quite a school of medicine of his own. It was not unusual in the early days for a practitioner to have students read medicine with him. Of these were the young schoolmasters in rural schools or ambitious local youths. Dr. Buck had as many as twenty students, most of whom became well known doctors, practising in Canada and elsewhere. His last student was Hamilton Meikle, son of Rev. Wm. Meikle, of Oakville, who taught the Appleby Public School. After graduation at Trinity College and a post-graduate course at Edinburgh, he joined the British Navy, winning by his high marks a berth in the flag-ship, the *Bellerophon*, serving his twenty years in her, when he retired. Dr. Buck's last partnership was formed with the late Frederick Bruce Mowbray in 1907. This was arranged to continue six years. The agreement having been signed, Doctor Buck stated that he would be eighty years of age at the termination of the contract and good for consultation work. He demonstrated, too, that he could pass suture material through the eye of a fine surgical needle and show no tremor. Unhappily, a year later, 1908, ill health terminated his active work. Doctor Mowbray continued in charge of the practice until 1912, when he removed to Hamilton. Through the kindly interest of Doctor Buck and members of his family the young man was enabled to do post-graduate work abroad. Returning to Hamilton, he continued a brilliant career in surgical work to the time of his tragically sudden death on November 11, 1931. This was but one instance of many where young students and practitioners were greatly benefited by association with Anson Buck.

In the midst of his professional work Doctor Buck served in public office continuously for half a century. In 1858, at the age of twenty-five years, he was elected a member of the local school board, in which office he served until 1907. Together with his township office he was a mem-

ber of the County Council, and was chosen in 1891 to the highest county office, that of Warden. It is recorded that in all this public service he never missed attending but one meeting, at which time he had travelled to Lyons, Iowa, to visit a dying sister and remained for her burial.

Another notable statement I am entitled to make is that, though he served hundreds of times on special committees and commissions, which must have consumed much valuable time and energy, Dr. Buck never accepted a dollar as recompense for this service. Ever driving on the public roads he knew where the danger spots were. He would carry a plank in his buggy and repair a defective bridge or culvert with his own hands rather than incur expense to the public funds. His fifty years of public service was celebrated by a large meeting at which he was compelled to listen to words of praise and gratitude from leading men of the county. On this occasion the people gave him a beautiful gold watch as a token of their love. This gift he left to his only grandson, who treasures it today.

In 1886 he was Liberal candidate for the Halton seat in the Legislature, but was not elected. A consistent Liberal, he was free of petty party feeling, and was no doubt a pioneer in teaching that strictly party Government was not an ideal institution, and this he often stated. Among his personal friends he numbered the late Sir Leonard Tilley, Sir Oliver Mowat and Sir George W. Ross.

As a teacher of temperance in all things he gave much thought to the liquor question. Not a radical prohibitionist, he believed in educating young people to feel that intemperance was "bad form". He was long highly esteemed in the executive of the "Sons of Temperance". Men and women who taught on the liquor habit as he did no doubt led the way to more rigid legislative control of the abuse of liquor, but they attained their great success by the consistency of their own life habits. They helped to make drunkenness unfashionable. As a boy I heard him speak in public on this and other social matters. He had a charmingly convincing manner of address, and spoke never a word of unkindness for those who taught contrary to his belief. A faithful member and supporter of his own Church he wore no religion "on his sleeve", but, as all valiant Christian gentlemen, he respected and defended all religious activities, irrespective of creed or altar.

Toward the close of the American Civil War, together with his boyhood friend, college chum and trusted confrère, Dr. Clarkson Freeman, of Milton, he entered for some weeks the medical service of the Federal armies in 1865. In a series of personal letters written at that time he gives graphic descriptions of his experience—at times as ambulance surgeon, at field dressing stations—sometimes for days together without

rest in the hospitals, dressing and amputating as the wounded poured in. His descriptions of long-sustained artillery actions, of cavalry charges, of gruesome work in the wake of retreating armies, show his ability to portray shifting scenes of military incidents. He was at Burksville, but twenty miles away, when the gallant Confederate General Lee surrendered to General Grant. He was in Washington the day President Lincoln was assassinated. Some of his letters should be preserved, showing as they do how vastly different conditions are now, compared with those of which he writes.

Regarding his trip to London in October, 1852—leaving his home at Palermo, his father riding beside him, he tells that his little mare actually stuck fast in the mud as he went through the "Sixteen Hollow". Along Dundas Street he bade farewell to all the neighbours and relatives. Eight miles brought him to the lake port, Oakville. Here he said goodbye to his father, who would take his horse home. A lake boat sailed to Toronto. There he renewed acquaintance with college mates and drove around the city with Doctor Aikins. Next day he sailed on the *Old America* for Rochester. Thence he took "the cars" to Albany, and thence boarded the ship *Hendrik Hudson* (on the Hudson River) arriving in New York next morning. He took "the cars" immediately for Philadelphia. This city he loved greatly, where friends of his college days gave him a welcome. After a few days there he sailed on the *City of Winchester* for London. The beauties of the Delaware River he describes, and the horrors of *mal de mer*, which lasted many days. He writes of walking the deck with a charming young Irish girl. This seemed "the cure". No further entry in his journal is made until he is settled in London. He was nineteen days in crossing over. In the following spring, returning home, he was thirty days at sea. He held the appointment of ship's surgeon on this voyage.

In 1908, after fifty-four years of active practice, he was rendered helpless and speechless by cerebral hæmorrhage. He was cared for in his own home until 1918, when he was removed to a Nursing Home at Toronto. One year later, 1919; he died of influenza. His intellect remained active to the end, and he never lost touch with matters of personal and public interest.

Two children, daughters, were born into his home. Always the lack of a son to such a man must be the cause of regret, but in this case his surviving daughter has splendidly supplemented her father's work. Making her home in Winnipeg, fifty years ago, as the bride of the late Honourable Colin H. Campbell, K.C., eminent barrister and sometime Attorney-General of Manitoba, a leader and tireless executive worker, she has made a record of civic and national work, in social welfare, philanthropy and education,

which marks her as a worthy daughter of Anson Buck.

In the summer of 1933 Mrs. Campbell commemorated the one hundredth anniversary of the birth of her parents at Palermo. Some five hundred guests assembled on the lawn of the old home of the remarkable physician, to tell again of their love for him to whom they owed so much. They came from all parts of Canada, and some from the United States. From New York came one whose proud distinction was that he was the first male child of Dr. Buck's Palermo practice, born July 29, 1854. With him came his wife, who was also one of the long list of nearly one hundred present who were born

under the care of the beloved doctor. Not often has a whole community and people from afar assembled to show their love of a village doctor who many years before had gone to rest. Surely his heart's desire so often expressed has been realized "to live in the hearts of my people". It was the Doctor's proud boast "that he never refused a call of suffering humanity or sued a man at court".

His sole direct living descendants are his daughter, Mrs. Colin H. Campbell, Winnipeg; his two grandchildren, Colin Howell Campbell, L.S.H. (R.C.), Calgary, Alberta, and Elizabeth Gertrude Wright (wife of Dr. Edward Nicol Wright), Toronto, Ont.; and a great-grandson, Colin Harrington Campbell in his second year.

Association Notes

PROGRAM FOR THE SIXTY-SEVENTH ANNUAL MEETING OF THE CANADIAN MEDICAL ASSOCIATION TO BE HELD IN VICTORIA, B.C., ON

JUNE 22, 23, 24, 25, 26, 1936

CONVENTION HEADQUARTERS, EMPRESS HOTEL

Monday, June 22nd

- 9.00 a.m.—Registration.
- 9.30 a.m.—Meeting of the General Council.
- 12.30 p.m.—Luncheon—Members of the General Council to be Luncheon Guests of the President-Elect, Dr. H. M. Robertson.
Valedictory Address of the President, Dr. J. C. Meakins, Montreal.
- 2.00 p.m.—Meeting of the General Council.
- 4.00 p.m.—Tea and Reception—Hostesses, Mrs. Norman Yarrow and Mrs. J. W. Spencer.
- 5.00 p.m.—Meetings of Committees.
- 6.00 p.m.—Meeting of Nominating Committee.
- 9.00 p.m.—Dancing and Bridge, Empress Hotel.

Tuesday, June 23rd

- 9.15 a.m.—Meeting of the General Council.
- 12.30 p.m.—Luncheon.
- 2.00 p.m.—Meeting of the General Council.
- 2.15 p.m.—Official Opening of Exhibit Hall.
- 3.00 p.m.—Garden Party at "Benvenuto", the home of Mr. and Mrs. R. P. Butchart.
- 4.00 p.m.—Annual Meeting of British Columbia Medical Association.
- 5.00 p.m.—Annual Meeting of Canadian Medical Protective Association.

Tuesday, June 23rd—Continued

- 7.00 p.m.—Members of the General Council of the Canadian Medical Association and the British Columbia Medical Council to be guests of the British Columbia Medical Association and the Victoria Medical Society at dinner at the Empress Hotel.
- 9.00 p.m.—Annual Meeting of the College of Physicians and Surgeons of British Columbia.

Wednesday, June 24th

- 8.30 a.m.—Registration.
- 9.00 a.m.—General Session in the Ball Room.
- 12.15 p.m.—Official Photograph of the Convention.
- 12.30 p.m.—Luncheon.
- 2.00 p.m. to 5.00 p.m.—Sectional Meetings.
- 4.00 p.m. to 6.00 p.m.—Garden Party at "Hatley Park", the home of Mrs. James Dunsmuir.
- 8.30 p.m.—Annual General Meeting, to which all members and their ladies, guest speakers and official delegates are invited.
* Music.
- 9.00 p.m.—Call to Order by the President.
— Invocation.
— Introduction of Guest Speakers and Official Delegates.

Wednesday, June 24th—Continued

- 9.00 p.m. — Presentation of Frederic Newton Gisborne Starr Award to Sir Frederick Banting, Dr. Charles Best, and Dr. J. B. Collip.
 — Announcement of Fellowships.
 — Installation of the President.
 — Address of the President.
 — Reception by the President and Mrs. Robertson, to be followed by dancing, cards and refreshments.

Thursday, June 25th

- 9.00 a.m. to 12.00—Sectional Meetings.
 12.30 p.m.—Luncheon.
 2.00 p.m. to 5.00 p.m.—General Sessions.
 2.00 p.m.—Meeting of incoming Executive Committee.

- 9.00 p.m.—Cabaret Supper and Dance.

Friday, June 26th

- 9.00 a.m. to 12.00—General Sessions.
 12.30 p.m.—Luncheon.
 2.00 p.m.—Annual Golf Tournament for The Ontario Cup.
 7.00 p.m.—Alumni Dinners and Class Reunions.

GENERAL SESSIONS

Place of Meeting—Ball Room, Empress Hotel

Wednesday, June 24th

- 9.00 a.m. Primary tumour of bone (Lantern Demonstration).—Dr. A. T. Bazin, Montreal;
 Results in the medical treatment of gastric ulcer.—Dr. E. E. Cleaver, Toronto;
 Curability of cancer of the stomach.—Dr. Verne Hunt, Los Angeles;
 Tumours of the upper urinary tract.—Dr. F. S. Patch, Montreal;
 The present trend in anaesthesia.—Dr. Beverley C. Leech, Regina;
 Embolism and thrombosis of the larger arteries; their diagnosis and treatment.—Dr. Duncan Graham, Toronto.

Thursday, June 25th

- 2.00 p.m. Silicosis research.—Sir Frederick Banting, Toronto;
 Methods of administration of hormones with special reference to protamine insulin.—Dr. Charles Best, Toronto;
 The significance of recent investigations on the ductless glands.—Dr. J. B. Collip, Montreal;
 Diverticulitis of the sigmoid colon.—Dr. R. R. Graham, Toronto;

Thursday, June 25th—Continued

- 2.00 p.m. A review of some aspects of the surgery of the sympathetic nervous system.—Dr. John Gunn, Winnipeg;
 The medical treatment of ringworm of the scalp.—Dr. D. E. H. Cleveland, Vancouver.

Friday, June 26th

- 9.00 a.m. A practical consideration of the mineral and vitamin requirements of man.—Dr. F. F. Tisdall, Toronto;
 Mortality and morbidity in acute appendicitis.—Dr. Gordon Fahrni, Winnipeg;
 Vascular episodes.—Dr. E. L. Pope, Edmonton;
 The treatment of carcinoma of the cervix.—Dr. Jas. C. Masson, Rochester;
 The Lister Oration.—Dr. E. W. Archibald, Montreal.

SECTIONAL MEETINGS**Section of Medicine****Wednesday, June 24th**

- 2.00 p.m. The recognition and treatment of myxœdema.—Dr. H. D. Kitchen, Winnipeg;
 2.30 p.m. Interpretation of heart symptoms.—Dr. H. H. Jennings, Calgary;
 3.00 p.m. The interpretations of some common digestive symptoms.—Dr. J. W. Scott, Edmonton;
 3.30 p.m. Epilepsy in general practice.—Dr. R. G. Armour, Toronto;
 4.00 p.m. Types of coronary thrombosis.—Dr. Murray Baird, Vancouver;
 4.30 p.m. Our present position with regard to psoriasis.—Dr. Harold Orr, Edmonton.

Thursday, June 25th

- 9.00 a.m. Prognosis in coronary thrombosis.—Dr. G. F. Strong, Vancouver;
 9.30 a.m. Peripheral vascular disease.—Dr. J. M. McEachern, Winnipeg;
 10.00 a.m. Intestinal absorption in its relation to allergy.—Dr. Robert L. Benson, Portland, Ore.;
 10.30 a.m. Some observations from the chest examinations of 40,000 people.—Dr. W. H. Hatfield, Vancouver;
 11.00 a.m. Functional disorders of the colon.—Dr. E. P. Scarlett, Calgary;
 11.30 a.m. Silicosis.—Dr. C. H. Vrooman, Vancouver.

Section of Military Medicine**Thursday, June 25th**

- 12.30 p.m. Luncheon—to be followed by the following papers:
 Importance of medical military documentation and its relation to pension matters.—Col. Fred C. Bell, C.M.G., D.S.O., Ottawa;
 Treatment of wounds in French hospitals.—Major J. L. Petitelere, C.A.M.C., Quebec.

Section of Obstetrics and Gynæcology**Wednesday, June 24th**

- 2.00 p.m. Chairman's Address.—Dr. J. R. Fraser, Montreal;
 2.30 p.m. Further experience in amnesia and analgesia in obstetrics.—Dr. L. C. Conn, Edmonton;
 3.00 p.m. Discussion.
 3.15 p.m. The present status of endocrine therapy in gynæcological problems.—Dr. A. D. Campbell, Montreal;
 3.45 p.m. Discussion.

Thursday, June 25th

- 9.00 a.m. External cephalic version.—Dr. F. G. McGuinness, Winnipeg;
 9.30 a.m. Discussion.
 9.45 a.m. Rheumatic heart disease and pregnancy.—Dr. D. N. Henderson, Toronto;
 10.15 a.m. Discussion.
 10.30 a.m. A personal series of hysterectomies and myomectomies, with a comparison of results of total hysterectomies *vs.* supra-vaginal hysterectomies and some points in technique.—Dr. J. J. Mason, Vancouver;
 11.00 a.m. Discussion.
 11.15 a.m. Endometrial hyperplasia. — Dr. Murray Blair, Vancouver;
 11.45 a.m. Discussion.

Section of Ophthalmology**Thursday, June 25th**

- 9.00–10.00 a.m. Clinical demonstration — Interesting Clinical Cases; Demonstration of Clinical Apparatus;
 10.00 a.m. Conjunctival melanomata.—Dr. A. E. MacDonald, Toronto;
 10.30 a.m. Essentials in treatment of detached retina.—Dr. W. G. M. Byers, Montreal;
 11.00 a.m. Practical perimetry construction and operation of tangent screen.—Dr. A. J. McLean, Portland, Ore.

Section of Otolaryngology**Wednesday, June 24th**

- 2.00 p.m. Chairman's Address.—Dr. M. J. Keys, Victoria.
 2.30 p.m. A discussion of septicæmia and sinus thrombosis.—Dr. A. T. Wanamaker, Seattle;
 3.00 p.m. Results of radical antral operations.—Dr. G. C. Draeseke, Vancouver;
 3.30 p.m. Measured blood loss in certain nose and throat operations.—Dr. F. D. McKenty, Winnipeg;
 4.00 p.m. Endoscopy with report of two hundred cases.—Dr. A. D. McCannel, Minot, N.D.;
 4.30 p.m. Effects of the pituitary upon atrophic rhinitis and otosclerosis.—Dr. R. Percy Wright, Montreal.

Section of Pædiatrics

(In conjunction with North Pacific
 Pædiatric Society)

Wednesday, June 24th

- 9.00 a.m. A case of Hirschsprung's disease.—Dr. W. E. M. Mitchell, Victoria;
 9.30 a.m. A case of Addison's disease.—Dr. R. A. Hunter, Victoria;
 10.00 a.m. Two unusual cases of congenital heart malformation.—Dr. Glenn Simpson, Victoria;
 10.30 a.m. The adrenal cortex in relation to conditions in childhood.—Dr. N. Kemp, Vancouver;
 2.00 p.m. Foot deformities in childhood and their treatment.—Dr. K. J. Haig, Vancouver;
 2.30 p.m. Survey of congenital syphilis in Vancouver.—Dr. E. J. Curtis, Vancouver;
 3.00 p.m. Fatigue in children.—Dr. George A. Lamont, Vancouver;
 3.30 p.m. Indications for antitoxin and toxoid therapy in osteomyelitis.—Dr. C. E. Dolman, Vancouver.

Thursday, June 25th

- 9.00 a.m. Mental hygiene in relation to infants and children. — Dr. R. P. Kinsman, Vancouver;
 9.30 a.m. Measles encephalitis. — Dr. Harold W. Price, Calgary;
 10.00 a.m. Basal anæsthesia in children's surgery.—Dr. Herbert E. Coe, Seattle;
 10.30 a.m. Intracranial hæmorrhage of the newborn.—Dr. Urban J. Gareau, Regina.

Section of Radiology**Wednesday, June 24th**

- 2.00 p.m. Chairman's address.—Dr. B. J. Harrison, Vancouver;
- 2.30 p.m. Quality of roentgen rays, its measurement and importance (Discussion).—Dr. R. R. Newell, Stanford University;
- 3.00 p.m. Common errors in diagnosis and treatment of malignancy.—Dr. E. E. Shepley, Saskatoon;
- 3.30 p.m. Discussion on the radiotherapeutic care of breast cancer.—Dr. C. M. Henry, Regina;
- 4.00 p.m. Discussion on the relationship of the roentgenologist and the hospital.—Dr. B. J. Harrison, Vancouver.

Thursday, June 25th

- 9.00 a.m. The roentgenographic image of bone lesions (Discussion).—Dr. C. G. Sutherland, Rochester;
- 9.30 a.m. Some of the limitations of the x-ray (Discussion).—Dr. Bernard Mooney, Edmonton;
- 10.00 a.m. X-ray treatment of the tonsils (Discussion).—Dr. Walter Morrish, Edmonton;
- 10.30 a.m. Discussion on radiotherapeutical care of cancer of the uterus.—Dr. W. H. McGuffin, Calgary.

Section of Surgery**Wednesday, June 24th**

- 2.00 p.m. Breast cancer.—Dr. M. R. MacCharles, Winnipeg;
- 2.45 p.m. Sequelæ of head injury. — Dr. Frank Turnbull, Vancouver;
- 3.30 p.m. Institutional care in treatment of poliomyelitis.—Dr. F. H. Mewburn, Edmonton;
- 4.15 p.m. (Subject to be announced later).—Dr. J. S. Burris, Kamloops.

Thursday, June 25th

- 9.00 a.m. Acute pancreatitis.—Dr. P. H. T. Thorlakson, Winnipeg;
- 9.45 a.m. Apical pulmonary tuberculosis with conservation of healthy lung.—Dr. Emile Holman, San Francisco;
- 10.30 a.m. Incision for difficult sclerectomy.—Dr. Lyon Appleby, Vancouver;
- 11.15 a.m. Our experience with the hormone treatment of the adenomatous prostate.—Dr. R. A. McComb, Toronto.

Section of Urology**Wednesday, June 24th**

- 2.00 p.m. Present status of prostatic surgery.—Dr. Lee Smith, Vancouver.
- 2.30 p.m. Bilateral renal calculi; the problem of recurrence.—Dr. A. B. Hepler, Seattle;
- 3.00 p.m. Congenital polycystic kidneys.—Drs. F. S. Patch and John Davidson, Montreal.

COMMITTEES ON ARRANGEMENTS**VICTORIA, 1936****EXECUTIVE**

- Chairman - - - - Dr. Hermann M. Robertson,
President-Elect, C.M.A.
- Vice-Chairman - - - Dr. F. Leeder
Dr. S. G. Kenning, President,
Victoria Medical Society
- Treasurer - - - - Dr. E. W. Boak
- Secretary - - - - Dr. C. A. Watson

CHAIRMEN OF COMMITTEES

- Finance - - - - Dr. M. J. Keys
- Program - - - - Dr. Gordon C. Kenning
- Arrangements - - - Dr. H. E. Ridewood
- Housing - - - - Dr. W. E. Scott-Moncrieff
- Transportation and
Garages - - - - Dr. E. C. Hart
- Publicity - - - - Dr. J. H. Moore
- Exhibits (Commercial) Dr. T. Miller
- Art and Hobbies
- Exhibition - - - - Dr. J. M. Fowler
- Entertainment - - - Dr. J. W. Lennox
- Golf - - - - Dr. F. M. Bryant
- Ex-officio - - - - Dr. A. B. Nash, Secretary,
Victoria Medical Society.

TRANSPORTATION

With regard to transportation we should state that identification certificates may be procured from the General Secretary's office for all who desire them, but we are informed by the transportation agent in Toronto that, in all probability, the summer tourist rate will be considerably lower than the identification certificate rate. Each man, before purchasing his transportation, should enquire with regard to the comparative costs of identification certificate plan and summer tourist rate.

Report of the Executive Committee**MARCH 13 AND 14, 1936**

The Executive Committee met in Montreal for two days, the following being present: Drs. Geo. S. Young (Chairman), J. C. Meakins, F. S. Patch, A. T. Bazin, Léon Gérin-Lajoie, K. MacKenzie, A. S. Kirkland, Duncan Graham, J. E. Bloomer, A. G. Nicholls, J. S. McEachern, E. S. Moorhead, G. Harvey Agnew, A. Grant Fleming and T. C. Routley.

Attention was given to a wide variety of subjects of interest to the profession, reference to which will here be made.

RESIGNATION

The Committee received and accepted the resignation of Dr. A. Grant Fleming who for several years has been Associate Secretary of our Publicity and Health Education Department.

FUTURE ANNUAL MEETINGS

Considerable thought and attention were given to this subject. The Committee will present to the General Council at the Annual Meeting, suggestions with respect to the places of meeting for the next ten years. Planning the meetings well in advance will prove to be helpful to host Societies and individual members alike.

JOINT MEETING WITH THE AMERICAN MEDICAL ASSOCIATION

An invitation is being extended to the American Medical Association to meet with us in Canada in 1939. After giving the matter most careful consideration, the Committee decided that, if our invitation be accepted, the meeting would be held in Toronto.

HEALTH INSURANCE IN BRITISH COLUMBIA

In February, Doctors Bazin and Routley, by invitation, proceeded to British Columbia to discuss with the profession there the subject of Health Insurance and the relationship of the Canadian Medical Association thereto. Following Dr. Bazin's report upon the visit, the following Minute was approved:

"The Executive Committee devoted many hours to a discussion of this problem with especial emphasis upon the relations of the Canadian Medical Association to the British Columbia Medical Association, and particularly in regard to the publication in the February issue of the *Journal*, pages 204-208, of an excerpt from the Minutes of the Executive Committee Meeting of October 31, 1935. The following resolutions, being duly moved and seconded, were passed:

THAT the Executive Committee expresses keen regret for the publication of this excerpt;

THAT the Executive Committee acknowledges full responsibility under the By-Laws for its publication, and whereas the Editor, having accepted personal responsibility for the publication and having expressed profound regrets, desires to join the Executive Committee in apology to the medical profession in British Columbia;

BE IT RESOLVED THAT a copy of this Minute be forwarded to the President of the British Columbia Medical Association and be published in the *Journal*."

FEDERATION

The Committee received with pleasure the following report with respect to Federation of the Provincial Associations with the Canadian Medical Association:

BRITISH COLUMBIA

Provincial Association approved of the principle. Committee studying the proposal. Will report at the provincial annual meeting in June of this year.

ALBERTA

Federation accomplished. Provincial Association is now known as "The Canadian Medical Association, Alberta Division", with 258 members (nearly 100 per cent of the medical profession of the province).

SASKATCHEWAN

Provincial Association approved of the principle. Committee studying the proposal. Will report at the provincial annual meeting.

MANITOBA

Provincial Association approved of the principle. Committee studying the proposal. Will report at the provincial annual meeting.

ONTARIO

Board of Directors of the Provincial Association approved the principle. Committee of Past-presidents studying the proposal. Will report to the provincial annual meeting.

QUEBEC

Principle approved by several medical societies in the province. Proposal to be studied further.

NEW BRUNSWICK

Principle approved by Provincial Association. A Study Committee will report to the provincial annual meeting.

PRINCE EDWARD ISLAND

Principle approved by Provincial Association. Association ready to take action.

NOVA SCOTIA

Provincial Association approved principle. Committee studying proposal. Will report to the provincial annual meeting.

The subject of Federation will be one of major importance in the deliberations of The General Council at the forthcoming annual meeting. The Committee believes that Federation, to be of value, requires mutual cooperation of a most practical nature. Evidence of such on both sides must be guaranteed.

THE ANNUAL MEETING

The Committee received with pleasure the detailed program for the Victoria meeting. Elsewhere in this issue of the *Journal* it is published. The Victoria Medical Society has made elaborate preparations for the comfort and pleasure of the members. A good attendance is anticipated.

FREDERIC NEWTON GISBORNE STARR AWARD

The Committee is pleased to announce that it has selected the following as the first recipients of the medals to be awarded in honour of our late esteemed colleague, Dr. F. N. G. Starr, Sir Frederick Banting, Dr. Charles Herbert Best, Dr. J. Bertram Collip.

The medals will be presented at the annual meeting. Mrs. Starr has very graciously accepted an invitation to be present.

RADIO ADVERTISING

The radio offers tremendous opportunities for advertising,—both good and bad. Too frequently the so-called health advertising is misleading and not in the public interest. The Executive Committee continues to urge upon the authorities that greater vigilance and care be taken in checking advertising continuities, to prevent fraudulent statements and claims being made.

OFFICIAL DELEGATES

Dr. H. S. Birkett, of Montreal, and Dr. R. D. Rudolf, of Toronto, have been appointed official fraternal delegates to the British Medical Association meeting in Oxford next July.

FEDERAL INCOME TAX

Regulations, with which members are familiar, stand. Efforts were made to have travelling expenses to medical meetings considered as deductible expenses, but the Commissioner advises that the Act would not permit such deductions to be made.

DELEGATES TO COUNCIL

The Committee would urge upon each Provincial Association the desirability of having full representation upon the General Council at the annual meeting. The General Council will meet on Monday and Tuesday, June 22nd and 23rd, in the Empress Hotel at Victoria, B.C.

Respectfully submitted,

GEO. S. YOUNG,
Chairman.

T. C. ROUTLEY,
General Secretary.

Hospital Service Department Notes

Hospital Economies an Asset to the Surgeon

The efforts of hospitals to economize are not always appreciated by the surgeon, who may find such efforts in conflict with his favourite technique or use of supplies, but a recent writer in *Modern Hospital*, Dr. Willard Bartlett, of St. Louis, points out that the exercise of hospital economies, by permitting a lower charge to patients, particularly with respect to the operating room and costs incidental to post-operative care, may actually help the physician or surgeon to receive his own remuneration. The writer points out the heavy financial drain upon the hospital, and thus upon the patient, through unnecessary hospital expenditure. He gives a number of examples. For instance, a well-timed basal anaesthesia greatly reduces the need for an excessive amount of one of the somewhat expensive gaseous anaesthetics; detachable knife and scissor blades, valuable though they are to small hospitals and the occasional operator, are costly to those hospitals who have somebody on their staff who can sharpen blades; a large amount of gauze may be saved by employing a substitute for abdominal viscera coffee-dams, dental rubber dam or long strips of muslin being suggested; catgut can frequently be used in smaller size (with less danger of strangulation of tissue and longer hospitalization), can be replaced by silk in many instances, and long ends could be re-sterilized by a process indicated; waxed silk is recommended instead of silk worm gut for reinforcing abdominal wall sutures; adhesive could be used much more sparingly, and, in fact, is contraindicated across the upper abdomen because of the danger of increasing respiratory complications. The writer also points out that dry sterilization of rubber gloves has not only greatly increased their use but has definitely decreased their life.

Various post-operative economies are suggested. The use of wire cages to permit the open treatment of wounds not only hastens recovery but is more economical; large amounts of gauze could be saved and recovery hastened if granulation surfaces were protected with rubber, oiled silk, etc.; cotton batting could replace absorbent cotton very frequently in various dressings; glucose could frequently be given by rectum, as formerly, instead of almost entirely by the more expensive intravenous route as is now so frequently practised; the use of proprietary, rather than the less expensive, pharmacopœial preparations, is deplored. While some of the economies suggested would not be advantageous, nor feasible in certain hospitals, and, in some instances, might prove less convenient than some of the more recently developed methods, nevertheless, their practice in the aggregate would result in considerable saving in hospital operation.

Two Fine New Hospitals Opened in Toronto

Hospital expansion has not been very marked during the past few years, but this year Toronto has opened two fine institutions which are a real credit to their sponsors. Both of these are new buildings, to house well-established institutions.

The Women's College Hospital is unique, in that it is staffed entirely by women. The new building is centrally located close to the heart of the city and is an excellent ten-storey structure with some 140 beds, although it is so designed that the present services could care for 350 beds. The top two floors are devoted to the fine and well-equipped surgical and obstetrical operating rooms and to the pathological and other laboratories. The accommodation for patients is modern in every respect and closely conforms to the standards set by the most up-to-date institutions. Ample space is set aside for the large out-patient clinic which was developed at the old hospital and for some years has utilized a residence on the present site. Most of the building was occupied before the official opening in January could be held. It is just a decade since this new hospital was planned, and its completion after a long struggle indicates the enthusiasm and spirit of those behind the institution.

The Toronto Western Hospital, with which is amalgamated the former Grace Hospital, has just completed a new private patients' pavilion which, being 14 storeys in height, is credited with being "the tallest hospital in the British Empire". This new building is immediately behind the former main building which has been remodelled, raised another storey and utilized as a sound screen for the new building in conformity with the latest recommendations on urban sound control. The new structure, which brings the total capacity to over 500 beds, houses the new operating and obstetrical suites and the pathological and radiological departments, as well as the private and semi-private rooms.

This new building has aroused considerable comment, for in many respects it embodies features not found elsewhere in Canada. Services have been unusually well planned, certain equipment has been installed not duplicated anywhere as yet, and it is probably the most heavily piped and wired hospital in the country. The room furnishings are particularly effective, and the bedside unit which was especially worked out for this hospital is the most efficient yet observed. The patients' dictograph call system is built into this unit. Beds, dressers and other bedroom furniture are rubber-buffered on all exposed edges, the dark buffer being worked into the modern design. All rooms on three of the floors are individually piped for oxygen-therapy. The top floor is a large solarium, equipped with a kitchenette, which is available for staff and other meetings and luncheons. The building is all

double-glazed and heavily insulated; the efficacy of this is proved in that, while the cubic contents of the building have been more than doubled by the new construction, the fuel consumption has remained stationary for comparable periods. The former main building, with its extra storey, will be utilized for public and certain semi-private patients, and the Grace Division, for which over the years its many friends have developed a deep affection, but which would need to be completely rebuilt to keep pace with modern changes, will be discontinued.

Provincial Association Notes

PROGRAM

Fifty-sixth Annual Meeting of the Ontario Medical Association

London, May 26, 27, 28, 29, 1936

The Committee in charge of arrangements for the coming Convention in London are all working hard and sparing no effort to make this meeting "A Convention Unique in the History of the Association".

We are here presenting the details of the completed program. From this you will be able to see the high calibre of the whole meeting, both professional and social. We would attract your attention especially to the Wednesday luncheon, when Lord Tweedsmuir will be present, and to the dinner dance Wednesday evening, when the Rt. Hon. R. B. Bennett will be our guest speaker. Thursday with the Golf and the Stag Dinner in the evening will supply ample entertainment even for the most fastidious guests.

This is also to be a Convention for the ladies, and our ladies' committee are busy with plans of entertainment. Both Wednesday and Thursday will be full days for the ladies.

For the golfers, London is a paradise of golf courses, all of which will be available for the members of the Convention. The Golf Tournament on Thursday will be held at the London Hunt and Country Club, where, it is perfectly evident from the entries already received, there will be plenty of competition for the Hamilton Academy of Medicine Trophy. The London Academy of Medicine is also donating a trophy to be played for by teams of four representing County and City Medical Societies, and while we are not averse to having this trophy leave London we are certainly not going to give it up without a struggle. It is urged that all entries be in by Wednesday noon in order that foursomes may be arranged as suitably as possible.

All in all it looks like a great convention. Plan to be present and bring your wives and sweethearts.

Tuesday, May 26, 1936

- 10.00—Meeting of Council.
- 1.00—Luncheon—Speaker, the Hon. J. A. Faulkner, M.D., Minister of Health.
- 2.30—Meeting of Council.
- 6.00—Round Table Dinner.

Wednesday, May 27, 1936

- 9.00—Dr. H. O. Foucar, London.—“Hare-lip and its treatment.” (Lantern slides).
- 9.30—Dr. G. S. Williamson, Ottawa.—“Cutaneous and untoward visceral reactions to some common drugs.
- 10.00—Dr. F. Lahey, Boston, Mass.—“Diagnosis and management of carcinoma of the colon.”
- 10.30—Dr. L. G. McCabe, Windsor.—“Cholecystitis.
- 11.00—*Intermission for viewing Scientific Exhibits.*
- 11.30—Dr. R. E. Holmes, Windsor, Nathan Sinai, D.P.H., University of Michigan, Ann Arbor.—“Preparation and value of medical relief statistics.”
- 12.00—Dr. A. H. Gordon, Montreal.—“Medical clinic, with presentation of cases.”
- 1.00—Luncheon—Guest, His Excellency Lord Tweedsmuir.—To be held in the Armouries. Ladies invited. Tickets—\$1.50 per person.
- 2.30—Business Meeting.
- 4.30—Garden party—University of Western Ontario, by the courtesy of the President and Board of Governors.
- 7.00—Dinner dance—Hotel London—Guest—Right Hon. R. B. Bennett. Tickets, \$5.00 per couple.

Thursday, May 28, 1936

- 9.00—Dr. K. G. McKenzie, Toronto.—“Neurologic diagnosis with presentation of cases.”
- 9.30—Dr. D. W. Boucher, Kingston.—“Abdominal and pelvic surgery of the sympathetic nervous system.”
- 10.00—Dr. H. B. Cushing, Montreal.—“Scarlet fever—course, prevention and treatment.”
- 10.30—Dr. L. F. Craver, Memorial Hospital, New York.—“Some aspects of cancer therapy.”
- 11.00—*Intermission for viewing Scientific Exhibits.*
- 11.30—Dr. E. P. Joslin, Boston.—“Insulin, new and old, in the treatment of diabetes.”
- 12.00—Dr. Foster Kennedy, New York.—Neurologic clinic, with presentation of cases.
- Luncheon—No official luncheon, on account of the golf tournament.

Thursday, May 28—Continued

- 1.00—Golf Tournament—London Hunt and Country Club—Green Fee, \$1.00. See exhibit of prizes at Hotel London.
- 7.30—Stag Dinner (informal)—Hotel London—tickets \$1.00. Presentation of golf prizes, dancing girls, skits, liquid refreshments, and fun galore.
- Humorous Speaker—Mr. Ed. Penny, Editorial Staff, London Advertiser.

N.B. GOLFERS.—Be sure and have your entries in by Wednesday noon, in order that flights may be arranged satisfactorily.

Friday, May 29, 1936

- 9.00—Dr. E. Shute, London.—“Menorrhagia and its modern treatment.”
- 9.30—Dr. E. C. Janes, Hamilton.—“Ischio-rectal fistula.”
- 10.00—Dr. G. B. Eustermann, Rochester, Minn.—“The rôle of gastritis in American medical practice.” (Lantern slides).
- 10.30—Dr. John Fraser, Montreal.—“The prophylaxis and treatment of puerperal infection.”
- 11.00—*Intermission for viewing Scientific Exhibits.*
- 11.30—Dr. L. G. Rowntree, Philadelphia.—“The rôle of the thymus and pineal glands in growth and development.”
- 12.00—Dr. Roscoe Graham, Toronto.—“Surgical clinic, with presentation of cases.”
- 1.30—Luncheon—Speaker.—Professor J. A. Spenceley, University of Western Ontario—Tickets, \$1.00.
- 2.30—Dr. W. G. Cosbie, Toronto.—“The alternative to Cæsarian section.”
- 3.00—Dr. R. F. Farquharson, Toronto.—“Pituitary syndromes.”
- 3.30—Dr. W. J. Deadman, Hamilton.—“Fatal air embolism—case reports.”
- 4.00—Dr. E. A. Bartram, London.—“Edema and its management.”
- 6.00—Class dinners may be arranged by any group wishing them.

Sectional Meetings

Eye, Ear, Nose and Throat

Wednesday, May 27, 1936

VICTORIA HOSPITAL, LONDON

CLINICAL DEMONSTRATIONS—9-12 A.M.

Dr. W. J. Brown, London.—“Zinc ionization in the treatment of chronic suppurative otitis media.”

Dr. Myron Metzenbaum, Cleveland, O.—“Replacement of the dislocated lower end of the septal cartilage.”—Demonstration of the operative procedure on clinical cases under general and local anaesthesia.

Wednesday, May 27—Continued

Dr. W. H. M. Thomson, London.—“Demonstration of a new hydro-ophthalmoscope.”

Dr. Septimus Thompson, London.—“Presentation of interesting clinical cases.”

Luncheon—Guest, His Excellency Lord Tweedsmuir.—London Armouries. (Ladies invited — Tickets, \$1.50).

Thursday, May 28, 1936

LONDON HUNT AND COUNTRY CLUB

SCIENTIFIC PAPERS—9-12 A.M.

Dr. S. Hanford McKee, Montreal.—“Malignant hypertension retinitis” (illustrated by lantern slides).

Discussion.—Dr. Wm. H. Lowry, Toronto, and Dr. W. F. Fraser, Ottawa.

Dr. J. Milton Robb, Detroit.—“Headache.” Discussion.—Dr. P. B. Macfarlane, Hamilton.

12.00—Luncheon.—At Hunt and Country Club for Eye, Ear, Nose and Throat men.

1.00—Golf Tournament—London Hunt and Country Club.—Green fee, \$1.00.

See exhibit of prizes at Hotel London.

7.30—Stag Dinner (informal)—Hotel London—tickets \$1.00. Presentation of golf prizes, dancing girls, skits, liquid refreshments and fun galore.

Humorous Speaker—Mr. Ed. Penny, Editorial Staff, *London Advertiser*.

SECTION OF RADIOLOGY

MEETING IN HOTEL LONDON

Thursday, May 28, 1936

9.00-9.20—Dr. R. A. Macpherson, St. Thomas.—“Cholecystography in the diagnosis of gallbladder disease.”

9.30-9.50—Dr. P. M. Andrus, London.—“The radiographic characters of bronchiectasis.”

10.00-10.20—Dr. H. C. Moloy, Sloane Hospital for Women, New York.—“Roentgenological interpretation and obstetrical significance of anatomical variations in the female pelvis.”

10.30-10.50—Dr. L. F. Craver, Memorial Hospital, New York.—“Some aspects of modern cancer therapy.” (To be presented in the General Session).

11.00-11.30—*Intermission for Viewing Scientific Exhibits.*

11.30-12.00—Dr. A. C. Singleton, Toronto.—“Gastro-intestinal clinic.”

Thursday, May 28—Continued

12.00-12.30—Diagnostic conference—presentation of interesting cases. All members are invited to bring films for discussion.

12.30-1.00—Business Session—election of officers.

Luncheon.—No official luncheon, on account of golf tournament.

1.00—Golf Tournament—London Hunt and Country Club—Green Fee, \$1.00. See exhibit of prizes at Hotel London.

7.30—Stag Dinner (informal)—Hotel London—tickets \$1.00. Presentation of golf prizes, dancing girls, skits, liquid refreshments and fun galore.

Humorous Speaker—Mr. Ed. Penny, Editorial Staff, *London Advertiser*.

LADIES PROGRAM

Wednesday, May 27, 1936

1.30—Luncheon—Guest—Lord Tweedsmuir, London Armouries.

4.30—Garden Party—University of Western Ontario, courtesy of the President and Board of Governors.

7.00—Dinner Dance—Hotel London—Guest—Rt. Hon. R. B. Bennett.

Thursday, May 28, 1936

Noon—Luncheon followed by Bridge—Hillcrest Inn, Port Stanley.

Evening—Dinner and Musicales, London Hunt and Country Club.

Arrangements for golf may be made at the Registration Desk.

SCIENTIFIC EXHIBITS

One of the outstanding features of this year's annual meeting of the Ontario Medical Association is the elaborate series of Scientific Exhibits to be shown contemporaneously with the presentation of the scientific papers. Almost all branches of medicine will be represented. All the exhibits with the exception of the Educational ones will be open to awards.

Below are listed in alphabetical arrangement the names of the participants in the Scientific Exhibit with the titles of their exhibits:—

Dr. Maude Abbott, Montreal—Congenital Cardiac Disease.

Dr. Gordon Calder, London—Allergy.

Dr. W. M. Carrick, Hamilton—X-ray Exhibit.

Dr. H. A. Cave, London—Hematology—Natural Colour Photomicrographs of Blood Smears.

Dr. D. W. Crombie, London—Tuberculosis and Chest Surgery.

Dr. T. G. H. Drake, Toronto—Antiques of Medical Interest.

Dr. J. L. Duffy, London—Pressure-Vacuum Treatment Unit.

- Dr. W. A. Elgie, Chatham—X-ray Exhibit.
- Drs. I. H. Erb and Gladys L. Boyd, Toronto—Childhood Pulmonary Tuberculosis and Bronchiectasis.
- Dr. J. K. W. Ferguson, London—Derivatives of Hæmoglobin which Affect the Colour of the Blood.
- Dr. J. H. Fisher, London—Unusual Tumours of the Gastro-intestinal Tract.
- Dr. W. M. Gilmore, Stratford—Lateral Roentgen Studies of the Spinal Column.
- Dr. J. C. B. Grant, Toronto—Accessory Hepatic Ducts. Duodenal Diverticulæ.
- Dr. A. Ham, Toronto—Disturbances of Calcium and Phosphorus Metabolism.
- Dr. P. W. Hardie, Hamilton—Intestinal Tuberculosis.
- Dr. E. C. Janes, Hamilton—Leg-Lengthening. Chest Surgery.
- Dr. R. A. Johnston, London—Acute Hæmatogenous Osteomyelitis.
- Dr. W. A. Jones, Kingston—Anatomical and Radiological Studies of the Spine.
- Dr. F. S. Kennedy, London—Bronchoscopy and Œsophogscopy.
- Dr. A. S. Kennedy, Hamilton—Tuberculosis and Diabetes.
- Dr. V. R. Lapp, Hamilton—Bronchoscopy and Œsophogscopy.
- Dr. A. G. McGhie, Hamilton—Cardiology.
- Dr. D. U. McGregor, Hamilton—Sympathetic Surgery on the Lumbar and Presacral Nerves. Urology.
- Dr. J. K. McGregor, Hamilton—Thyroid Surgery. Bile Tract Surgery.
- Drs. George McNeill and F. F. Baker, London—Intra-oral Radium Applicators.
- Dr. James Miller, Kingston—Surgical Pathology of Gallbladder. Ectopic Gestations.
- Drs. W. E. Caldwell, H. C. Moloy and D. Anthony E'Esopo, New York—Anatomical Variations in the Female Pelvis: Recognition and Obstetrical Significance.
- Dr. M. C. Morrison, London—X-ray Examination of the Heart. Cholecystography.
- Dr. A. H. Pirie, Montreal—Reading and Seeing Pictures with Closed Eyes.
- Drs. G. A. Ramsay, A. J. Read, V. A. Callaghan, C. C. Ross, J. B. Robinson, London—Fracture Therapy.
- Dr. G. E. Richards, Toronto—Radiation Therapy in Cancer.
- Dr. A. C. Singleton, Toronto—Radiology and Diagnosis of Disease.
- Dr. W. S. Stanbury, Hamilton, Pathology of Tuberculosis.
- Dr. E. Shute, London—Fetal Deformities in Rats Resulting from Vitamin E-free Diet.
- Dr. A. E. Walkey, Hamilton—Bone Lesions.
- Dr. E. M. Watson, London—Demonstrations in Diet Therapy in Infant Feeding.
- Dr. E. M. Watson and A. S. Barber, London—Laboratory Procedures.
- Dr. E. M. Watson and A. D. Carpenter, London—The Application of Photo-electric Principles in Clinical Pathology. Demonstrations of Medical Photography.
- Dr. G. S. Williamson, Ottawa—Cutaneous and Untoward Visceral Reactions to Drugs.

EDUCATIONAL EXHIBITS

- Canadian Red Cross Society—Nutrition.
- Ontario Department of Health—Cancer Control. Services to Physicians. Ontario Hospital, London.
- Neuropathology—Dr. J. A. Hannah, Toronto.
- Periodic Health Examination Committee of the Ontario Medical Association.
- War Memorial Hospital, London.

The exhibits will occupy three halls on the main floor of the hotel and will be open each day from 9 a.m. to 5 p.m. A selected group of scientific motion pictures will be shown continuously each day in a hall adjoining the convention.

M. C. MORRISON, *Convener,*
Committee on Scientific Exhibits.

Medical Societies

The Canadian Rheumatic Disease Association

A meeting was held at Ottawa on February 14, 1936, for the purpose of organizing a Canadian society for the study and control of rheumatic diseases. The following were present.

Drs. H. B. Church, Aylmer; J. L. Murray, Orthopaedic Surgeon, Ottawa; H. H. Eyres, representing Canadian Pension Commission, Ottawa; G. Douglas Taylor, representing McGill University; H. Hetherington, St. Michael's Hospital, Toronto; A. A. Fletcher, representing Toronto University, Toronto; W. F. Connell, representing Queen's University, Kingston; Warren S. Lyman, representing Royal College of Physicians of Canada, Ottawa; J. Fenton Argue, President, Medical Protective Association, Ottawa; T. A. Lomer, representing University of Alberta, Ottawa; R. E. Valin, Secretary, Royal College of Surgeons of Canada, Ottawa; Wallace Troop, Metropolitan Life Insurance Co., Head Office for Canada, Ottawa; S. Mirsky, Medical Arts Building, Ottawa; G. J. Wherrett, Canadian Tuberculosis Association, Ottawa; J. D. Heaslip, Department of Health for Ontario, Toronto; W. S. Barnhart, Medical Arts Building, Ottawa; G. P. Brown, representing Health Branch, Department of Pensions and National Health, Ottawa; T. L. Fisher, Medical Arts Building, Ottawa; J. J. Heagerty, Department of Health, Ottawa; F. S. Burke, Department of Pensions, Ottawa; S. H. McCoy, Ottawa; H. E. Hanna, Ottawa; Ross Millar, Director Medical Services, Department of Pensions and National Health, Ottawa; Captain H. Hunter, representing Royal Canadian Air Force, Ottawa; Major Linton, Department of National Defence, Ottawa; Mr. R. G. Cameron, President, Ontario Society for Crippled Children, Ottawa; Mr. R. W. Hopper, Secretary, Ontario Society for Crippled Children, Toronto; Colonel J. L. Potter, representing Department of National Defence, (D.G.M.S.) Ottawa.

Dr. Ross Millar stated that the Honourable the Minister of the Department of Pensions and National Health had been good enough to cover certain necessary preliminary expenses, but that this action should not be misunderstood to mean that the proposed project would be conducted as a Federal responsibility. It was intended that the new society should stand on its own feet as a branch of the International Society with headquarters at Amsterdam, and should be more or less associated with the Canadian Medical Association, of which body it had the approval.

Dr. R. E. Wodehouse welcomed the representatives who were present from the various universities and other organizations, and promised cordial cooperation from the Department.

He announced that the Department had already begun to build up an "arthritis section" in its library, chiefly of monographs on particular aspects of arthritis and rheumatism, and that such books would be made available to any doctor who wished to make himself more conversant with the modern advances and discoveries in respect to this subject. Dr. Wodehouse stated that he was fully aware of the extent to which rheumatic diseases were prevalent in Canada and causing distress, loss of work, and large expenditure, and he wished the new society God-speed in its efforts.

The chairman and secretary for the meeting, and until the regular officers should be appointed, were nominated from the floor and elected as follows: *Chairman*, Dr. Ross Millar; *Secretary*, Dr. W. S. Barnhart.

The reasons and authority for calling the meeting.—The preliminary notices were read, and also several of the responses from various doctors to whom the questionnaire had been sent. About 250 of the representative doctors in Canada had been circularized, and 95 per cent of those who replied affirmed their wish that such a society should be formed, and promised cooperation.

A letter was read from Dr. R. Fortescue Fox, of London, England, the President of the Ligue Internationale Contre Le Rhumatisme. He strongly recommended the cooperation of medical men with public persons and industrial and social representatives, as well as the proper cultivation of physical medicine in rheumatic disease, and said that it would be necessary to avail ourselves of the physical remedies available in a far more precise and scientific manner than heretofore.

After some discussion, it was moved, seconded and carried

"That those attending this meeting and those who were unable to attend, but who signified their interest in the purpose of the meeting, do now form themselves into an organization to be known as 'The Canadian Rheumatic Disease Association', with the understanding that the name is subject to change at the first Annual Meeting."

The chairman then read to the meeting a copy of a proposed Constitution for the Association. This was discussed clause by clause and a few changes were made. All the articles and clauses were discussed and approved individually, then it was unanimously agreed that the entire Constitution of the Association as amended should be adopted.

The meeting then proceeded to the election of officers, with the following results.

Honorary President, Dr. J. C. Meakins, Royal Victoria Hospital, Montreal; *President*, Dr. Almon A. Fletcher, Toronto; *1st Vice-president*, Dr. A. Lesage, Montreal; *2nd Vice-president*, Dr. F. T. Cadham, Winnipeg; *Secretary*, Dr. W. S. Barnhart, Ottawa; *Treasurer*, Dr. J. Fenton Argue, Ottawa.

Appointments as Provincial Chairmen resulted as follows.

Prince Edward Island, Dr. J. A. MacPhee, Summerside; Nova Scotia, Dr. Kenneth A. MacKenzie, Professor of Medicine, Dalhousie University, Halifax; New Brunswick, Dr. G. C. VanWart, Past-president, Canadian Medical Association, Fredericton; Quebec, Dr. G. Douglas Taylor, Montreal; Ontario, Dr. Warren S. Lyman, Ottawa; Manitoba, Dr. Gibson, Associate of Dr. Cadham, Winnipeg; Saskatchewan, Dr. Duncan Croll, Saskatoon; Alberta, Dr. Allan C. Rankin, Dean of Medical Faculty, University of Alberta, Edmonton; British Columbia, Dr. Stuart Kenning, Victoria; Yukon and Northwest Territory, Dr. Jas. A. Urquhart, Aklavik.

It was decided that the Council should be asked to submit a report to the next general meeting of the Society concerning the definite nomenclature to be used in this Society.

It was decided to appoint a special committee for the purpose of studying ways and means of determining the incidence of rheumatic diseases in Canada.

After some discussion, it was resolved unanimously that the Council should undertake the following work.

- (1) Prepare a report on the inaugural meeting and send copies to each member of the Association and to the Editor of the *Canadian Medical Association Journal*.
- (2) Submit to the Editor of the *Canadian Medical Association Journal* a notice inviting new members to the Association.
- (3) Collect membership fees.
- (4) Obtain the necessary stationery and issue membership cards.
- (5) Communicate with the officers of the Canadian Medical Association and the International League with a view to affiliation.
- (6) Stimulate the organization of Provincial Committees.
- (7) Prepare progress reports and arrange for the first general meeting in Victoria, B.C., in June.
- (8) Undertake other work, as provided in Article II of the Constitution.

A resolution was passed tendering the thanks of the meeting to the Department of Pensions and to Dr. Ross Millar and Dr. W. S. Barnhart, for carrying through the heavy, preliminary "spade work", which led up to this meeting and the formation of the Society.

Dr. Joseph Murray proposed that the Society should get in touch with the Provincial Departments of Education for lay instruction of teachers and pupils, in order to get at the cases of rheumatism among the youth of the country.

Mr. Cameron, the President, and Mr. Hopper, the Secretary of the Ontario Society for Crippled Children, offered whatever lay assistance might be desired.

Dr. Wallace Troop, the Chief Examiner for the Metropolitan Life Insurance in Canada, remarked on the number of cases of arthritis coming before his company, and the tremendous cost and loss of time ensuing. He was asked and consented to compile statistics for the Society, saying the Metropolitan Life stands behind any body doing work of this kind and their statistics are always available for study.

The Calgary Medical Society

The regular monthly meeting of the Calgary Medical Society was held at the Provincial Sanatorium at Keith on March 10, 1936. Dr. H. H. Stevens, a member of the staff of the Sanatorium, read a paper on "Closed intrapleural hæmolysis, for cutting bands in the pleura" and Dr. A. H. Baker, the Superintendent, gave an address on "Differentiation between tuberculous and non-tuberculous patients". Both papers were listened to with rapt interest. Refreshments were served before the journey back to Calgary was made.

G. E. LEARMONTH

The Edmonton Academy of Medicine

The March meeting of the Academy, which was well attended, was held in the Medical Building of the University of Alberta on March 4th the President, Dr. Gordon Gray in the chair. The first item on the scientific program was an interesting paper on "The present status of prostatic surgery." In calling attention to the large number of males over fifty years of age who are affected by a more or less degree of disability due to disease of the prostate gland, the speaker emphasized the necessity of careful examination of the patient, including cystoscopy, to diagnose the type of prostatic disease present. At present the trans-urethral resection, or "punch prostatectomy", is being used in a greatly increased number of cases with good results.

Then followed a well prepared paper with lime-light views, by Dr. Bernard Mooney, radiologist, on "Some of the limitations of the x-ray". In opening the subject, the speaker drew attention to the fact, that it is now forty years since the discovery of the x-ray, and while it must be admitted that advances in this particular branch of medicine have been epoch-making, nevertheless its limitations could be very profitably considered. The field is too large and only a superman can master the technique and interpretation of x-ray findings. One of the greatest limitations of the x-ray is the economic one, the cost of examination being in many cases prohibitive. On the other hand, the well-equipped radiologist spends a large portion of his lifetime in paying for apparatus. At present many radiologists are forced to compete with group-hospitalization schemes, advertising x-ray work at half price. The radiologist under this arrangement works for the hospital in almost direct opposition to himself.

The lack of special teaching in radiology in some of our medical colleges was referred to by the speaker, who stated that, if our present curriculum is over-burdened, some unnecessary subjects should be drastically excised to give

time for the more important, such as radiology.

The difficulties and pitfalls in the radiological diagnosis of gastric, duodenal or jejunal ulcer, early carcinoma of the stomach, cholecystitis, appendicitis and diseases of the colon were pointed out. In conclusion the speaker stated that radiology should not be divorced from clinical medicine and that the radiologist should not be too busy or indolent to study carefully the clinical history of the patient.

Discussion of the paper followed, participated in by Dr. R. Proctor, Radiologist of the University Hospital, Dr. H. K. Groff, Medical Director of the Compensation Board, and Dr. Anderson, Medical Superintendent of the Royal Alexandra Hospital, who discussed the subject from the standpoint of group hospitalization, pointing out that all large hospitals were compelled to have a fully equipped x-ray department for the benefit of the public.

Dr. D. S. Macnab of Calgary, President of the Alberta Medical Association, at the close of the meeting gave a short address on the organization of local medical societies throughout the province as units of the Alberta Branch of the Canadian Medical Association.

T. H. WHITELAW

The April meeting of the Academy held on April 1st, had for the scientific program the following items. Two short papers were given by Dr. L. C. Conn on "Sterility in the female", and by Dr. Kenneth Hamilton on "The relationship of the thyroid to heart disease". Both papers indicated close study and careful research of the subject presented and were greatly appreciated by the large number of members present.

The main subject of the evening was an address by Dr. R. D. Callaghan, of Calgary, on "Some aspects of general surgery", with special references to mistakes that arise in the practice of all men doing general surgery. In his treatment of the subject the speaker covered the whole subject in the most complete detail, illustrating his remarks by relating his observations on the work of many well known and eminent surgeons in the larger centres he had visited.

T. H. WHITELAW

The Montreal Dermatological Society

A meeting of the Montreal Dermatological Society was held at the Royal Victoria Hospital, on February 22, 1936, under the auspices of Dr. Philip Burnett. The President was Prof. Albéric Marin. All the members, fifteen in all, were present and also about twelve invited guests. Thirty-one patients were presented. Microscopic slides, pictures, and moulages were exhibited during the evening.

Tea was served, and scientific discussion then followed.

It was proposed by Dr. Burgess, seconded by Dr. Ereaux, that the matter of deciding the date of the meeting of the British Dermatological Association (Canadian branch) and the Atlantic Sea Board, which is taking place in Toronto, be left in the hands of the Executive.

That in the future it is in the interest of the Society that the number of patients presented should be thirty.

That the Secretary keep a record of all the patients presented.

That, as in the past, a dinner be given which is to be paid for by the Association.

That it is not necessary to place a notice in the hospitals regarding the dates of the meetings.

That the next meeting will take place in April, at the Nôtre-Dame Hospital.

It was proposed by Dr. Burgess, seconded by Dr. Usher, that a vote of thanks be given to Dr. Burnett for the success of this meeting.

Following the meeting, a dinner was served at the University Club.

PAUL POIRIER,
Secretary-Treasurer.

The Montreal Medico-Chirurgical Society Section of Pædiatrics

An interesting program, on the subject of rheumatic infection in children, was presented at the regular monthly meeting of the Pædiatric Section of the Montreal Medico-Chirurgical Society at the Children's Memorial Hospital, on March 13th. In opening the discussion, Dr. H. B. Cushing explained that it was now about 15 months since a special hut for rheumatic disease in children had been opened by the Hospital. There had been some uncertainty as to whether there would be patients enough to justify the setting aside of these special 30 beds, but within two weeks of the opening they had been filled to capacity, and had remained so ever since, with a steady waiting list. This really was no more than was to be expected, perhaps, in a city of the size of Montreal, where, according to the accepted statistics of rheumatic fever, there must always be a large number of cases.

This special hut had been built with two main ideas in mind: (a) to segregate the rheumatic cases of the hospital, so as to lessen their changes of acquiring the ordinary respiratory and other common infections which every children's hospital is subject to; and (b) to permit of more intensive study of the disease. The hut, which was a special unit, with its own specially designed heating (a point being made of maintaining a constant humidity) had beyond any doubt justified its construction. Dr.

Cushing also remarked that visitors to it were usually struck by the fact that all the children in it seemed to be about the same age, demonstrating the fact that the rheumatic infection in childhood was usually first manifest between the ages of seven and ten. Another point brought out later on was that in building the ward the beds had been divided equally between the two sexes, and it was only later when it began to fill up that it was realized that rheumatic infection is usually twice as prevalent amongst girls.

Dr. H. L. Bacal then described the special methods by which the progress of the disease was followed, particularly the blood sedimentation curve, the Schilling differential count, the white cell count, and the albumin-globulin ratio of the blood. These were particularly valuable as guides to the stage of the disease, and helped greatly in deciding such questions as when tonsils should be removed, or other foci treated. Making these observations meant constant routine examinations of the blood, but the information thus obtained was well worth the effort.

When it came to the matter of treatment, discussed by Dr. R. R. Struthers, it was shown that we know of no new therapeutic measures. As long as we did not know the cause of rheumatic fever we were greatly hampered in treating it. Therefore we had to make the most of what control we could exert over the course of the disease or its prevention, and these laboratory measures gave us the most exact knowledge of its stages that we can at present obtain. Dr. Struthers also stressed the importance of tracing and eradicating foci of infection. But he also dwelt on the fact that apparently slight operations, such as tonsillectomy or antral lavage, were actually a great strain on the children, and should always be regarded as such. This was clearly shown not only in the general condition of the patients, such as the loss of weight, but by the sedimentation rate and other blood changes. In passing, he paid tribute to Dr. H. B. Cushing, to whose energy and foresight the Hospital in large measure owed the addition of the hut.

Dr. F. W. Wiglesworth gave an extremely lucid account of the Aschoff body, describing its evolution and its significance in myocardial weakness. In discussing this, Dr. C. P. Howard referred to the discovery of the Aschoff body as one of the great landmarks in our knowledge of rheumatic fever, even though we had so much farther to go. The program was completed with a discussion of the various cardiac murmurs heard in rheumatic disease of children by Dr. S. J. Usher, who, without unduly stressing their importance, showed that they must be constantly watched in order to properly estimate their significance.

The Ontario Society of Radiological Technicians

On the 22nd, and 23rd of May next, the Ontario Society of Radiological Technicians plans to hold its first annual convention. This pioneer meeting has secured accommodation at the King Edward Hotel, in Toronto.

To radiologists in particular, and the medical fraternity in general, a most cordial invitation is extended to attend.

Papers of technical and timely interest will be read; and the exhibits, both of radiographs and equipment, show promise of presenting features of merit.

The Toronto Biochemical Society

The 42nd meeting of the Society was held in the Household Science Building, University of Toronto, on February 20th. The following communications were presented.

V. E. HENDERSON AND A. H. R. SMITH—The Anaesthetic Action of Some Furan Derivatives.

It was shown by one of our colleagues some years ago that furan was an anaesthetic with very peculiar actions, and this led to the study of dimethyl-furan, tetrahydro-furan and dimethyl-tetrahydro-furan. The study of this group showed that the forms with double bonds, furan and dimethyl-furan, were more potent than the saturated members. This is in accordance with results obtained in other groups, and that methylation again increases the potency. Under conditions of prolonged exposure to these anaesthetics, fatty changes appear in the liver similar to those produced by ether, and their peculiar constitution suggests that it might be possible by means of these substances to gain some understanding of this type of anaesthetic toxicity.

M. R. MCKELLAR, M. L. LIMMO, L. P. LOCKHART, M. E. ROBERTSON AND B. C. WILLIAMSON—Losses in Cooking Vegetables.

In this study, the losses of total solids, reducing substances and ash were determined for white and sweet potatoes, white and yellow turnips, parsnips, green beans, celery, cabbage and cauliflower. Investigations were limited to the effect of boiling.

White potatoes showed the smallest loss, 3.4 per cent of its total solids, while cabbage and yellow turnips lost 36 to 42 per cent of their total solid material. The losses were negligible when white or sweet potatoes were boiled in their jackets. Soaking whole pared white potatoes for three hours before cooking caused only a small increase in the losses. With the root vegetables the loss of reducing substances represented 67 to 75 per cent of the total solids lost.

The losses increased with the length of cooking, the smallness of the pieces, and increased proportion of water. The results seemed to indicate that, in general, of these three factors,

the size of the pieces was the most important, green beans losing 50 per cent of their ash when cut into "slivers", as compared with 12 per cent when boiled whole.

C. E. SNELLING—A Method for Estimating Vitamin A Deficiency. (Demonstration).

K. C. FISHER AND L. IRVING—The Exhaustion of Processes Maintaining the Rhythm of the Heart.

At constant temperature in tap water the rate of embryo trout and salmon hearts is nearly constant. If the water be replaced by neutral cyanide solutions the rhythm is depressed after a short interval, and promptly falls to a new level which is usually maintained for some period. The time course of this depression is accurately described by an equation having the form $Kt = \log \frac{R_p}{R_t}$, R_p being the total amount rate

is to fall (or the difference between the normal level and depressed level), R_t the amount the rate has fallen at time "t" (in minutes), and "k" the velocity constant of the equation. This equation would describe the course of the diffusion of cyanide into the animal, and hence from the form of the relation possibly diffusion time accounts for the shape of the curve. Consideration of the values of "k" found over a wide concentration of cyanide makes it extremely improbable, however, that the curve does represent the establishment of a diffusion equilibrium. On the other hand the interval between the application of cyanide and the first appearance of a depressed rhythm appears to be directly related to cyanide concentration. Diffusion of cyanide into the animal is then complete, or nearly so, by the time the rate has begun to fall, so that the equation given above describes the exhaustion of that part of the mechanism maintaining the rhythm of the beat which is sensitive to cyanide. The "k" varies irregularly between 0.05 and 0.2 and R_p from 45 to 65 per cent of the normal rate over the range of cyanide concentrations from N/200 to N/10000.

A. D. ODELL AND G. F. MARRIAN—An Acid-hydrolysable Complex of Pregnandiol in Human Pregnancy Urine.

Human pregnancy urine contains besides free pregnandiol ($C_{21}H_{36}O_3$), a complex which yields pregnandiol only after acid hydrolysis. This complex is not hydrolysed by heating to 100° with alkali. It is soluble in butyl alcohol; it has no marked acidic properties. Its chemical nature has not yet been determined.

The Winnipeg Medical Society

The newly formed Obstetrical and Gynaecological Section sponsored the meeting of the Winnipeg Medical Society which was held in the Medical College on March 20th. Dr. Jas. A. Urner, Associate Professor of Obstetrics and Gynaecology, University of Minnesota, spoke on

"The Indications for and the Relative Safety of Forceps Operations". In a series of 9,070 cases at the Minnesota General Hospital during the last six years there were 268 forceps operations, a percentage of 2.9. Of these operations low and outlet operations formed 93.6 per cent; mid-plane 5.2 per cent, and high forceps 1.1 per cent. In the forceps group maternal morbidity was found to be four times more common than among the group with spontaneous deliveries, and the fetal death rate was twice that of spontaneous deliveries. All the patients were charity patients and 90 per cent were on relief. Eighty-five per cent had had prenatal care, but, in spite of that care, Dr. Urner felt that in the classification in which he dealt there was an ever present danger of infection, and it was largely for that reason that he abstained from operative interference.

Dr. Alfred Savage, Dean of the Faculty of Agriculture, University of Manitoba, spoke on "Veterinary Sidelights on Reproduction". He discussed particularly the anatomy and physiology of placenta in the lower animals, the gestation period, and artificial insemination.

ROSS MITCHELL.

Special Correspondence

The Edinburgh Letter

(From our own correspondent)

The subject of physical education is receiving a great amount of attention at the present time. On account of the falling population it is regarded as a matter of national concern that the present standard of fitness of the population of Scotland should be raised if the nation is to maintain its industrial efficiency. A recent meeting of those interested in the subject was held in Dunfermline and addressed by Mr. John Jardine, F.R.C.S.E., the Assistant Secretary to the Scottish Education Department. Mr. Jardine said that the sickness returns of the National Health Insurance scheme showed that there was a vast amount of minor, and often nervous, ailments which could be greatly reduced if a more complete system of physical education was introduced into the schools. There was a great need for the building up of a system of physical education which was physiologically and psychologically sound. Such a system might play a large part in leading the youth of the country away from the broad road of self-indulgence and moral and mental slackness to the narrow path of self-discipline and useful and willing service to the community. Physical education, said Mr. Jardine, should not be regarded as a sort of extra subject; it must be regarded as fundamental, with claims equal to, if not greater than, other subjects. It should engage the attention not only of the specialist

teacher but of every teacher, and especially of the head master and the head mistress. It was also important that all teachers should by personal example instill hygienic habits in their pupils. The education department was of opinion that in primary schools there should be a daily physical education lesson of not less than 20 minutes, and in post-primary schools the minimum time allotted should be two periods a week for physical training, and at least two hours one afternoon for games. The Director of Education for Wigtownshire, Mr. H. Stewart Mackintosh, a former Scottish Rugby Internationalist, also addressed the meeting. He considered that there had been a serious abuse of physical education among several nations on the Continent. "Our aim," he continued, "is not to turn out a soldier, a gymnast, or a games expert. The end of physical education, as of all education, ought to be to lay down the broad basis of a liberal training which will permit ready adaptation to the many and varied demands of life." He believed that in the past over-emphasis had been placed on the intellectual side of the child's education and insufficient attention paid to his health and character. It was necessary to strike a happy mean and secure a proper balance between the child's varied needs. He considered that teachers of physical training should have a liberal general education. "Our schools," he commented, "have suffered enough in the past from narrow specialization."

Dr. O. H. Mavor (James Bridie, the playwright) delivered the closing address for the winter session to the students of the Anderson College of Medicine, Glasgow. Dr. Mavor urged the students to have a "good conceit" of the profession, for its record in peace was no less uplifting to the spirit than its record in war. About twenty years ago he said—and it was a solemn thought that many of them there could not remember it—the peoples of the world were engaged in smashing, tearing, torturing, suffocating, drowning, and starving each other. The great majority of the population set about the business of cold-blooded, senseless, wholesale, brutal murder—some at great personal risk, some at no risk at all. They were faced with the choice between being traitors or murderers, and might be again if they weren't collectively and inhumanly wise. He was telling them of their dilemma and how badly they solved it. But there was one body of men who escaped the shame of it. The medical profession—British, French, German or Russian—came out of it all pretty well. They could think of it and hold up their heads. They went through the filthy battlefields dodging the flying metal, pulling their comrades out of danger, tending the hurt and sick without much distinction between friend and enemy. Many of them saw the hazards of battle without willingly injuring

a fellow creature. Into that profession, Dr. Mavor said, you are laboriously making your way. He told them all that so that they might have a good conceit of the profession and of themselves when they became members of it.

The Public Health Department of the Edinburgh Corporation is at present holding an exhibition in the city with a view to enlisting the cooperation of the citizens in health matters and to stimulate their interest in the city's health agencies. The exhibition was opened by Lord Rosebery. Among the activities demonstrated are those of the school medical service, the mental institutions which show examples of work done by patients, the child welfare work, the measures taken to safeguard food supplies, the latest fire fighting appliances and exhibits by the roads, water, transport, gas, electricity, cleansing and housing departments. Stage performances include a tableau representing the life of Florence Nightingale in which about thirty city hospital nurses take part in costumes appropriate to the Crimean period.

R. W. CRAIG.

7 Drumsheugh Gardens,
Edinburgh.

The London Letter

(From our own correspondent)

The Medical Research Council's Annual Report recently issued is, as always, full of interesting material and the expenditure for the year, namely £165,000, has been utilized over a wide field. Pride of place has been given during the past twelve months to problems of nutrition and while special aspects of the subject have proved capable of scientific investigation the broader problems still seem as far off from solution as ever. For example, one group of investigators have shown that most of the iron of vegetables and bread is utilized by the human organism, whereas only a little of the iron in meat is of value in this sense. The practical application of such a scientific fact is obvious. Taking the thing more broadly, it seems clear that the public must be told to take much more milk, cheese, butter, eggs and vegetables. A recent survey by Sir John Orr has been the subject of much discussion, for one of his conclusions is that there are millions of people in this country whose diet is deficient in essential constituents. Over half the population is missing something which is considered important for health and physique. On the other hand Dr. Robert Hutchison, president of the Royal Society of Medicine, pointing out the very great difficulty which exists in the assessment of nutrition, has issued a strong protest against the pessimism as illustrated in Sir John Orr's report, and against the optimism which promises great things by alterations in the

national diet. As usual, the truth is somewhere between the two extremes. Unfortunately, politics have now been introduced, to complicate what was already by no means a simple problem, and no doubt the opposition parties favour Sir John Orr rather than Dr. Robert Hutchison. If the assessment of nutrition could be reduced to simple figures it would be a great step forward. With regard to the experts who agitate for the public to drink more milk, it is worth while pointing out that the recent reorganization of the milk markets has raised the price of milk supplied to hospitals, clinics and other institutions. This can scarcely be taken to set off the cheaper supplies made available for school children.

The recent Annual Report of the National Radium Commission is a more spirited document than usual, for it recommends strongly that more radium is needed and expresses a belief that at least another twenty grammes could be usefully employed. In earlier reports the Commission has been more guarded regarding the use to which the nation's radium has been put at certain centres, and, as has been mentioned from time to time in these letters, there is a definite change of policy with regard to the larger units. It is clear that decentralization of radium has been abundantly justified and the coordination of the activities of all those concerned in a national scheme is bringing about encouraging results. There are, however, still considerable areas for whose populations radium therapy is not properly available, and more centres, which means more radium, are definitely needed and advised.

The activities of the London County Council since 1930, when so many duties were transferred to it, have been mentioned from time to time, and recently information has been published on the remarkable ambulance services provided. In one year over 360,000 persons were carried in the Council's ambulances, and the total mileage was over two million miles. There are over 150 ambulances and 20 ambulance omnibuses. Stations situated all over the London area are run very much like the fire engine services, and the time taken for the ambulance to turn out after a station has been informed is somewhere in the neighbourhood of fifteen seconds. The whole activities are controlled through a large central telephone switch-board, and the organization is run in a thoroughly efficient manner. The special ambulances used for emergency work contain a great deal of special equipment, such as drugs, surgical instruments for the use of a doctor, oxygen apparatus, as well as the usual stretchers, blankets, splints and bandages.

Who owns x-rays? This question which has been asked by many patients ever since radiology began has never been answered by a legal

case in this country. The British Institute of Radiology has issued an authoritative opinion that a radiograph negative is the property of the radiologist by whom or under whose instructions or in whose department it was made. Clearly in hospital work this point is highly important, and in private practice patients are only too often inclined to imagine that their x-ray photograph is as much theirs as an ordinary photograph would be. This analogy with portraiture is frankly misleading, although it is very popular. It would be satisfactory to have a leading case settled in the courts, although no one is likely to run counter light-heartedly to the British Institute's opinion.

ALAN MONCRIEFF.

121 Harley St.,
London, W.1.

Letters, Notes and Queries

Can These Things Be? A Plea for Physical Culture

To the Editor:

I read with much appreciation your editorial on the above subject. The public appreciate that the skill of our surgeons, our dentists, is above reproach, but our physicians come in for a lot of criticism which is I think justified. "By their fruits ye shall know them", and the results of our work, as shown by Dr. Black's trenchant criticism, are not good. Professor Tweedy of the Rotunda Lying-In Hospital used to teach us that the baby is only a little animal; today it is treated as a pathological puzzle, with the result we interfere with Nature as much as possible, and make a very bad job of it. One of Nature's most drastic laws is that if a member is not used, it loses its powers, yet we unite to prevent the little animal using its members; patent foods ruin its digestion; all sorts of barriers are erected; we put on glasses for fear the child's eyes may be strained; we cut out the tonsils in case they may be infected; the appendix is often removed as a precaution; we induce rotten bones by destroying the calcium in the milk given. In fact, we do all we can in the name of science to produce civilized and unhealthy children. Then we survey the official death figures and wonder. Heart disease heads the list of deaths in Canada, in the *Bulletin* I received from the Alberta Medical Association, yet Nature has given us all we need to produce strong hearts, immune to all heart troubles, except probably angina pectoris. Trying to interest the medical men, I received a

Answers to questions appearing in this column should be sent to the Editor, 3640 University Street, Montreal.

most offensive letter from a Government chemist who said all sugars were the same. Presumably, he would add that a dead man was the same as a living one, because the chemical contents of his body were the same as the living man's! Be that as it may, the British Medical Association has recognized the work of an eminent Cambridge University man, who has shown that living (raw) cane sugar does possess properties not found in refined cane sugar or in beet sugar. It seems unfortunate that a valuable discovery like this should be ignored in Canada where heart disease heads the list as the most common cause of death. There is a growing irritation against the infringement of the rights of the individual to live as he feels right, and I hope that soon compulsory legislation dealing with subjects such as food will be stopped. There is more than a growing suspicion that Big Business is behind these pseudo-scientific attempts to dragoon the people into certain habits of living.

This letter would not have been written but for Dr. Black's able criticism and the action of the British Medical Association in awarding Dr. Goulston the Hunterian Medal for his discovery—a discovery that shows the present high death rate in Canada from heart disease is due to the ignorance of physicians, and is quite uncalled for.

C. G. S. BARONSFEATHER,
Edmonton, Alta.,
March 10, 1936.

Udga Tablets

To the Editor:

There is a proprietary preparation on the market called "Udga Tablets", which is recommended by the makers for the treatment of gastric ulcer. Could you tell me what the ingredients of this tablet are?

THOS. B. MURPHY, M.D.
Antigonish, N.S.,
January 31, 1936.

Answer.—The following statement about "Udga" is taken from the *Journal of the American Medical Association*, for February 15, 1930, page 504, and records a qualitative investigation conducted by the Bureau of Investigation of the American Medical Association. It embodies all that can be said about this preparation at the moment. [Ed.]

"The formula of Udga is, apparently, secret—at least none of the voluminous advertising matter and follow-up letters that we have on file give it. The Udga Medicine Company, which puts out this preparation, was formerly known as the Phungen Laboratories. The preparation is advertised as a mail-order treatment for stomach ulcer, gastritis and dyspepsia. Our readers may remember a similar product, known

as Pfunder's Stomach Tablets, sold from Minneapolis and dealt with in THE JOURNAL, December 1, 1928. Because of the similarity in name ("Phungen" and "Pfunder"), a still greater similarity in the appearance of the product, the contiguity of the concerns that put them out, and the fundamental fact that both preparations are advertised as remedies for stomach ulcer, the American Medical Association Chemical Laboratory was asked to make some qualitative tests to determine whether or not the same ingredients that were found in the Pfunder Stomach Tablets were to be found in the Udga Stomach Treatment. The Laboratory reports that the tests indicated the presence of bismuth, magnesium, sodium, nitrates, carbon dioxide and starch. It seems quite likely, therefore, that the preparation is similar in composition to the Pfunder Stomach Tablets, which were found to contain bismuth sub-nitrate about 30 per cent, magnesium oxide about 22 per cent, and sodium carbonate about 24 per cent."

Abstracts from Current Literature

Medicine

The Nature of Osteogenesis Imperfecta. Puppel, I. D., Barron, L. E. and Curtis, G. M., *Am. J. M. Sc.*, 1935, 190: 756.

The authors report a case of osteogenesis imperfecta, a male of 17 who was born with slate blue sclerae and a fracture of the right arm and left leg. Since this time he has sustained 48 fractures. Apart from the marked skeletal deformities, examination revealed nothing other than slight anaemia, blue sclerae and dwarfism. No fracture of the hands or feet occurred and a decreased tendency to fragility of the bones was noted after puberty. Examination of the brothers of the patient revealed typical blue sclerae but no bony deformities. Calcium and phosphorus studies revealed normal serum content and urinary excretion. The blood iodine and urinary excretion of iodine were increased. Chlorides were normal. The authors conclude that the disease is not due to hyperparathyroidism, but is more likely a congenital hypoplasia of mesenchyma, associated with a deficiency in bone phosphatase production.

E. S. MILLS

The Development of Mitral Stenosis in Young People. Bland, E. F., White, P. D. and Jones, T. D., *Am. Heart J.*, 1935, 10: 995.

This study was made in an attempt to explain the marked discrepancy between the clinical diagnosis of rheumatic mitral stenosis and the

actual alterations found at post-mortem. The error in diagnosis was found most often in young patients dying relatively early after the onset of severe rheumatic fever. Conclusions are drawn from a study of the necropsy findings and clinical records of 100 patients, twenty-one years of age or younger, who showed at post-mortem examination the changes in the heart generally attributed to rheumatic fever. The most important source of error in diagnosis was found to be the general unqualified acceptance of a mid or late rumbling diastolic murmur at the cardiac apex as indicative of mitral valve obstruction. The presented material clearly shows that with severe and recent rheumatic infection in childhood, when well-marked cardiac enlargement is known to have occurred within a few months, the presence of a rumbling sound or short blowing murmur in mid diastole or late diastole in the vicinity of the cardiac apex in addition to the usual systolic murmur cannot be considered pathognomonic either of mitral stenosis or of any other extensive valvular deformity, but is dependent fundamentally upon severe myocardial disease. It is to be noted that the less the evidence of active infection and of cardiac dilatation, the more significant of mitral stenosis is the mitral diastolic murmur. The murmur occurring without stenosis appears to be due to myocardial weakness and ventricular dilatation. It is recorded that out of a total of 950 patients with rheumatic heart disease, who at the time of their acute rheumatic fever showed cardiac enlargement and mitral diastolic murmurs, 32 cases were encountered which were wrongly attributed to mitral stenosis. They have all been followed over an eight year period and have clinically normal hearts. In conclusion it is stated that the ultimate development of extensive valvular deformity, either with or without actual stenosis of the mitral orifice, probably requires a minimum of two years and in most instances a considerably longer period of time.

W. H. HATFIELD

The Anatomical and Hydrostatic Basis of Orthopnoea and of Right Hydrothorax in Cardiac Failure. Dock, W., *Am. Heart J.*, 1935, 10: 1047.

This paper gives a very able presentation of a complex subject. Such a common phenomenon as orthopnoea has been widely discussed, yet never really adequately explained. It is pointed out that the hydrostatic analysis of pulmonary venous drainage has not been used to account for orthopnoea and the preponderance of right-sided pleural transudates. The relative positions of the centres of mass of the lung and of the left ventricle are carefully studied by serial sections, radiographs and charts. The centre of the right lung is found to be about 10 cm. in the left lateral position. The general level of pulmonary

venous pressure depends on the level of cardiac output to be maintained on the level of ventricular efficiency and on the gravitational gradient between the venous ends of the lung capillaries and the left ventricle. Raising the shoulders brings the effect of gravity to aid respiration, in that the pulmonary blood flow to the heart is changed from an uphill to downhill flow. The right lung on the whole is much more often dependent than the left, and, therefore, has a higher venous pressure. Accordingly hydrothorax is more easily produced on the right side than the left; also the left lung has less lower lobe surface than the right, and it is the lower lobes which have the highest venous pressure. Elasticity of the lung diaphragmatic movements, etc., are all mentioned, but it is stressed that hydrostatic factors of an anatomical origin altering venous pressure are of paramount importance in causing orthopnea and the preponderance of right pleural transudation in patients with heart failure.

W. H. HATFIELD

Surgery

The Surgical Technique of Total Pneumonectomy. Rienhoff, W. F., Jr., *Arch. Surg.*, 1936, 32: 218.

During the past few years the author has made several contributions to the literature on the technique of total pneumonectomy. Resection of an entire lung seems to be a feasible operation which has proved itself worthy of a place among the recognized, technically safe, procedures.

The material from which this report is made is composed of 10 cases in which total pneumonectomy had been performed, and 20 others in which, because of the extent of the disease process, it was impossible to remove the whole lung. In 4 of the total pneumonectomy group, the operation was performed on the right side and in 6 on the left. Eight of the 10 patients, were operated on for malignant tumour of the lung and 2 for unilateral tuberculosis. In this group there was one post-operative death on the fifth day, from diffuse lobular pneumonia. Three patients died later, one six weeks after operation with cerebral metastases, one in three months from tuberculosis of the remaining lung, and the third six weeks later, from pulmonary embolism. The remaining 6 are alive. The preparation of the patient before operation is of the greatest importance, to ensure stabilization of the pulse and blood pressure during the operation and successful primary healing of the bronchus, together with subsequent obliteration of the dead space. Complete collapse of the lung is essayed by gradually induced pneumothorax.

By this means the cardio-respiratory mechanism is stabilized and the patient becomes accus-

tomed to breathing with one lung. During the past two years Rienhoff produced an inflammation of the parietal and visceral pleura, to incite a serofibrinous pleurisy followed by the formation of granulation tissue. His reason for adopting this measure is that it is much more difficult to infect a granulating surface. In 52 cases as a result of this lining of granulation tissue not one instance has occurred of generalized empyema or mediastinitis.

The surgical technique of the operation is described in detail. The approach to the lung is performed without resection of ribs. An anterolateral incision is made through the third interspace, from the parasternal line in front, to the anterior axillary line laterally. Self-retaining retractors are used. The methods of dealing with the large pulmonary vessels and bronchus in the hilus of the right and left lungs is carefully considered. In all of his cases tri-brom-ethanol in amylene hydrate, 80 mg. per kilogram, was used by rectum as an anæsthetic.

G. E. LEARMONTH

Primary Carcinoma of the Lung: Early Diagnosis and Treatment by Pneumonectomy. Overholt, R. H., *New Eng. J. Med.*, 1936, 3: 93.

It has now been demonstrated that one lobe of a lung or the entire lung on one side can be successfully removed, and that this procedure does not limit the patient's ability to enjoy the ordinary activities of life. Patients should receive the benefit of treatment while the lesion is still local in its extent.

A persistent cough is a warning symptom. All patients of middle age or past middle age who develop a chronic and persistent unexplained cough should be studied bronchoscopically. A large majority of the growths originate in a stem bronchus, and therefore can be actually visualized with the bronchoscope. The stem-bronchus lesion is limited by cartilaginous rings, and apparently grows slowly over a period of months until the infiltrating process breaks through these bounds.

The author analyzes 23 cases of primary carcinoma of the lung. The bronchial and pneumonic forms are differentiated. A cough is the most frequent early symptom; expectoration, wheezing, and hæmoptysis may be present fairly early. The value of diagnostic aids such as x-ray, bronchoscopy, lipoidal visualization, pneumothorax, and intrapleural thoracoscopy, has been pointed out.

Treatment by radiation has been ineffective. The possible cure of primary carcinoma of the lung by resection of an entire lung is considered. Five successful pneumonectomies are reported, 3 for malignant and 2 for suppurative disease.

LILLIAN A. CHASE

Obstetrics and Gynaecology

Intraspinal Alcohol Injections and Sympathectomy Associated with Carcinoma of the Cervix. Greenbill, J. P. and Schmitz, H. E., *Am. J. Obst. & Gyn.*, 1936, 31: 290.

Pelvic sympathectomy at first seemed to give spectacular results, but later proved to be less satisfactory. Complete relief from pain in patients with advanced carcinoma was obtained in 37.5 per cent of the first 40 cases, partial relief in 35 per cent, and failures in 27.5 per cent. However, when only those patients were selected who had pain in the middle of the lower abdomen, pain low in the back, rectal tenesmus, bladder pain, and pain associated with vesicovaginal and rectovaginal fistulas, complete relief was obtained in practically all cases. More recently intraspinal injections of alcohol were resorted to in order to relieve the pain associated with Group III and especially Group IV carcinoma of the cervix. Among the first 40 patients taken at random complete relief was obtained in 85 per cent, partial relief in 5 per cent, and no beneficial effect in 10 per cent. In some cases relief lasted for eight and a half months. The only patients not suitable for intraspinal alcohol injections (at least in the lumbar region) are those who have pain not only in the kidney region but also in the parametrium due to stricture of the ureter associated with hydroureter and hydronephrosis. Intraspinal injection of alcohol is preferable to sympathectomy, not only because it is much simpler and can be performed by any qualified physician familiar with the essential features of this procedure but also because it may be used in a greater number of cases, and it gives relief to a larger percentage of women with advanced carcinoma of the cervix.

ROSS MITCHELL

Primary Squamous Cell Carcinoma in the Body of the Uterus. Gellhorn, G., *Am. J. Obst. & Gyn.*, 1936, 31: 372.

Two personal observations of primary squamous-cell carcinoma in the body of the uterus are recorded and added to the very scanty international literature on the subject. Squamous-cell cancer cannot develop directly from the cylindrical epithelium of the endometrium. There must first occur as a connecting link a change from the cylindrical into pavement epithelium. This metaplasia may be either the result of certain conditions acquired during the lifetime of the individual or it may be the expression of a faulty embryonic development. Both these etiological factors are discussed briefly. The treatment is by operation rather than by radiotherapy.

ROSS MITCHELL

Pædiatrics

Calcified Abdominal Glands in Children. Smith, C. A. and Ames, F. D., *J. Pædiat.*, 1936, 8: 205.

The authors present a study of 147 children seen in the past ten years in whom calcification of the abdominal glands has been demonstrated. All but sixteen of this group have been traced by questionnaires, etc.

An old tuberculous lesion appears to be almost always responsible for these glands and in this series all those tested with tuberculin (119 cases) were positive. Definite thoracic tuberculous lesions were demonstrated in 13.8 and non-thoracic in 17.6 per cent. Tuberculous peritonitis was present in 7 children. There seems to be little or no danger of spread to the peritoneum from well-calcified mesenteric glands. The tuberculosis in the glands and in the peritoneum, when they occur together, apparently arises from a common source. A relatively large percentage of the patients came from communities where pasteurization of milk was poorly controlled. A definite contact with an open case of tuberculosis was present in only 10 per cent. This would point to the family milk supply as a frequent pathway of infection.

Sixty-nine children were symptom-free, and their follow-up showed that with ordinary hygienic care they have remained so. Seventy-one children showed symptoms attributable to the glands. Pain was the most common, usually prolonged, recurrent, and related to fatigue and strain but not meals. A few showed nausea and vomiting. They were almost afebrile and not badly nourished, anæmic, or easily fatigued. A review of the roentgenograms showed no particular size, location, shape, degree of calcification or number of glands to be characteristic for the production of pain. Tenderness was present in 32 cases, frequently in the right lower quadrant, and frequently not corresponding to the position of the glands.

Conservative treatment should be given a prolonged trial, and will in the great majority of cases be successful. Surgical manipulation of tuberculous glands not completely inactive may involve some risk to the patient. When, however, intermittent and severe abdominal pains persist or increase during years of treatment with rest and hygiene, surgical excision of the offending gland is indicated. Three such cases were treated surgically with relief of pain.

ALAN ROSS

The Use of a Blood Coagulant Extract from the Human Placenta in the Treatment of Hæmophilia. Eley, R. C., Green, A. A. and McKhann, C. F., *J. Pædiat.*, 1936, 8: 135.

Observations are presented on the use in the treatment of hæmophilia of a tissue protein pre-

pared from the human placenta. Unlike the "immune globulin" described by McKhann which is a pseudoglobulin present in the placental serum and the organ itself, the coagulant fraction is a very insoluble globulin derived from the placental tissues. *In vitro* it reduces the coagulating time of blood in dilutions as high as 1:10,000. In rabbits after intraperitoneal injection of 1 c.c. of the extract a prompt reduction in the clotting time of both venous and capillary blood was observed. Intravenous injection in various animals resulted in death due to thrombosis.

Fifteen patients suffering from hæmophilia were given the blood coagulant extract. When administered orally a reduction in the venous and capillary coagulation time was demonstrated in 15 to 20 minutes. Intramuscular injection gave a much slower response, requiring several hours. The dosage and the duration of effect varied with each patient, and, possibly due to varying conditions in the digestive tract, varied in the same patient at different times. Case reports are presented of 2 patients suffering from hæmophilia in whom the coagulation time of the blood has been maintained at about normal levels by the administration of the extract by mouth in 5 c.c. doses once or twice a week. Whether this material will have an effect in arresting internal hæmorrhages in hæmophilia patients remains to be seen.

ALAN ROSS

Ophthalmology

A Contribution to the Question of Ocular-Focal Infection. Kapuscinski, W., *Ann. d'Ocul.*, 1935, 172: 817.

In spite of numerous publications on the above subject, a wide difference of opinion still exists among the profession. The author does not attempt to review the literature but refers specifically to two recent publications, that of Zanettin in Italy and that of Hessberg in Germany.

In approaching the subject of focal infection, and for a better understanding of the condition, it is necessary to examine thoroughly the primary inflammatory focus. Tuberculosis today is considered by the German school as the most common cause of inflammation in the eye, particularly in the uvea. Even if this opinion is correct, it is necessary to see if the tuberculous alterations are not often metastatic inflammations from a distant tuberculous focus. Most ophthalmologists who speak of focal infections of the eye do not think of tuberculosis but of some far removed inflammatory focus in the tonsils, prostate, pharynx, sinuses or teeth. It is about the importance of the dental focus that opinions are most divided. The original focus in most of the cases studied was dental. There was only one case, an iridocyclitis in a patient of 23 years, where appendicitis was put forward as the cause.

This opinion was verified by the surgeon, and two weeks after the operation the precipitate had disappeared from Descemet's membrane. In 51 cases of unilateral iritis and iridocyclitis, radiograms of the teeth were made in all cases, also a Wassermann was done, and a tuberculin test made. In the 51 cases bad teeth were the undeniable cause in 11 in which the inflammation rapidly disappeared five to eight days after extraction.

S. HANFORD MCKEE

Streptococcal Pseudomembranous Conjunctivitis. Kluever, H. C., *Am. J. Opth.*, 1935, 18: 1094.

The pseudomembranous conjunctivitis in a girl of 6 years, complicated by pseudomembranous vaginitis and acute glomerular nephritis, persisted for thirty months and resulted in the loss of one eye. *S. hæmolyticus* was repeatedly isolated from the pseudomembranes. Scarlet fever streptococcal antitoxine exerted a favourable effect upon the disease. Subcutaneous administration of scarlet fever, streptococcal toxin, intradermal administration of autogenous streptococcal vaccine, and local application of filtered autogenous broth vaccine (Besredka) stimulated the formation of pseudomembranes. Comparable pseudomembranes were produced experimentally in rabbits with subconjunctival injections of *S. hæmolyticus* and its toxins. When the inefficacy of ordinary therapeutic measures is contrasted with the results obtained in this case it seems justifiable to recommend the use of scarlet fever streptococcal antitoxin in cases of pseudomembranous conjunctivitis which are not due to readily recognizable causes.

S. HANFORD MCKEE

The Functional Examination on Patients Operated upon for Retinal Detachment and Considered Cured. Desvignes, P., *Ann. d'Ocul.*, 1936, 172: 976.

We know that the retina has three functions; the perception of light, of colour and of form. These functions differ in the peripheral visual field and in the macular area. For a complete study of retinal function it would therefore be necessary to study each of these functions in these two areas, but such a study has numerous difficulties. In particular we have no apparatus at our disposal which permits of the exact measurement of the minimum of light perceptible or the differential minimum. In studying the capacity of retinal adaptation to darkness the author has employed the skotoptikometer of C. Edmund. The method is given in detail and the results of seven observations. He found in all cases (1) adaptation to darkness is much diminished, (2) the visual peripheral field for white was found nearly normal in all cases where there were no chorio-retinal cicatrices, (3) the visual clearness was low in four of the seven observations.

S. HANFORD MCKEE

Urology

A New Method for the Relief of Hydrocele.

Livermore, G. R., *J. Urol.*, 1935, 34: 446.

The author points out that the ordinary method of operation not only requires hospitalization but often results in swelling and deformity for a long time. The method proposed is as simple as aspiration, can be done with local anaesthesia, and does not confine the patient to bed. It is performed as follows. The hydrocele is aspirated with a large gall-bladder trochar. Narrow shoe-string tape is saturated with sodium morrhuate solution and packed loosely through the cannula into the sac, care being taken to insert the tape completely throughout the cavity. A gauze dressing and suspensory bandage is applied. Each day a little is pulled out, removing it all on the seventh. In the cases in which the author has used it, it has resulted in 100 per cent cures, and there is little complaint at the fractional removal of the tape.

N. E. BERRY

Selective Irradiation in the Management of Teratoma Testis.

Ferguson, R. S., *J. Urol.*, 1935, 34: 458.

Barringer and Dean have shown that irradiation is the treatment of choice for teratoma testis. In a series of 154 cases, 89 per cent of which were inoperable on admission; 29.2 per cent were alive without evidence of disease after 5 years. Hinman in a series of 100 cases submitted to operation by his own radical technique reports 17 per cent of 5-year cures. Most of Dean's cases were treated by the usual full erythema dose at 50 cm. target with low filtration. In the absence of demonstrable disease treatment was carried up only to the renal pedicle which accounted for many failures due to recurrence in the epigastrium above this level.

In 1930 Coutard reported his technique, which roughly consists in increasing the target distance, increasing the filtration, decreasing the daily dose and greatly increasing the total dose delivered to each area. The practical benefits are an increased dose at a depth of 10 cm. in the body, which, on continued delivery, results in a cumulative lethal effect on the tumour which far exceeds that on normal tissues. Hence it is possible to deliver to radio-resistant tumours of low grade a dose which may result in complete disappearance. From a clinical point of view, patients stand this treatment much better and have less vomiting than with the old technique.

In 1931 a series of 25 cases were treated in this way and a series of 27 cases, all average run of hospital cases, were treated by the old technique. In the first series 48 per cent were

alive and well in April of this year and 37 per cent of cases treated by the old technique were alive and well.

These results led to an investigation of the character of the tumours in which results had been successful, and it was found that an increased percentage of tumours, formerly thought to be resistant, were cured by the divided dose method. It was also evident from a study of the old series that intensive radiation with less filtration and larger daily dosage was preferable for the more sensitive types. The biological response, as measured by the assay of Prolan A, is the most reliable index of radiosensitivity. And this together with the histological structure points the way in treatment. The more resistant the tumour, the greater the necessity for more prolonged, less intense, radiation; the more sensitive the tumour, the greater the necessity for intensive radiation.

N. E. BERRY

Neurology and Psychiatry

A Psychiatric Concept of Acute Alcoholic Intoxication.

Fleming, R., *Am. J. Psychiat.*, 1935, 92: 89.

Though much is now known concerning the pharmacological action of alcohol on the various systems and organs, the larger concept of the effect upon the individual as a whole has been almost entirely neglected. It is, of course, obvious that the rôle played by constitutional and environmental factors must be of considerable importance. As in the consideration of any clinical entity the effects of alcohol may be considered under physical and mental headings. In the simpler physical realm the most striking features are the disturbances in sensation, circulation and motor coordination. Underlying these are the generalized depressant effect and the less definite splanchnic constriction with concomitant peripheral engorgement. Mentally, the most striking feature is the slackening of inhibitory bonds. In the early stages facility of association and not infrequently of speech takes place. Mood changes are fairly constant. But no clearcut picture can be drawn; the protean psychiatric picture is still that of the particular individual, though dosage and tolerance have a rôle to play. All the generalizations concerning alcoholic effects are futile, so widely varied are the responses of individual personalities to this, as to any other potent stimulus.

The author concludes as follows (1) the effects of alcohol are dependent on two main factors, (a) the pharmacological effects on the body systems, (b) the personality of the individual. (2) The pharmacological action is modified by the dosage, the concentration and the physiological state of the individual but is ultimately dependent on the concentration of

alcohol in the tissues. (3) The study of the influence of personality factors on the picture of intoxication has been neglected but offers a promising field of psychiatric investigation.

(One would like to add a personal commendation of the unusual literary standard attained in this paper. Source material from the classics and the Bible, from Chaucer, Montaigne and Dickens, from Macbeth, Othello and Jorrock, constitute a real oasis in the somewhat arid desert of medical literature; all this not detracting, but adding to the real scientific value of the production.)

G. N. PATERSON-SMYTH

Tumours of the Neuromyo-arterial Glomus.

Stout, A. P., *Am. J. Cancer*, 1935, **24**: 255.

Before the first accurate description of these tumours in 1924 they were reported under a number of different names, such as angiosarcoma, perithelioma, and painful subcutaneous nodule. Glomi are peculiar neurovascular structures which occur normally in the skin of the extremities, particularly of the hands and feet. They are fundamentally a form of arteriovenous anastomosis, and probably have something to do with the regulation of skin temperature in the extremities. Glomic tumours are small, usually bluish, raised nodules and most commonly arise beneath a finger nail. They are composed of a tangled mass of blood vessels enclosed within a capsule. The capsule is made up of peculiar "glomus" or "epithelioid" cells and smooth muscle. The most characteristic symptom of these tumours is exquisite and agonizing pain which comes in attacks lasting a few minutes to several hours. Usually the paroxysms are initiated by pressure or by change in weather, particularly by cold. Associated disturbances suggestive of sympathetic system lesions, such as ipsilateral Horner's syndrome or associated local sweating, are frequently noted. Early recognition and removal of these tumours may avert years of pain and misery for the unfortunate victim. Simple excision has resulted in immediate cure of the symptoms in every case, but it is possible for the tumour to reappear long after operation.

FRANK TURNBULL

Therapeutics

Mandelic Acid in the Treatment of Urinary Infections. Lyon, D. M. and Dunlop, D. M., *Brit. M. J.*, 1935, **2**: 1096.

The authors report their results in the treatment of 16 cases of severe intractable urinary tract infections with mandelic acid. It is pointed out that the success of the ketogenic diet in such infections depends on the excretion in the urine of B-hydroxybutyric acid. Rosenheim found that mandelic acid was a relatively non-toxic substance, which was not oxidized when given by the mouth, and was excreted un-

changed in the urine, where it exerted a similar bactericidal effect if the urine was strongly acid. The acidity is achieved by giving ammonium chloride, gr. 60 to 120 or more, daily, so that the urinary pH falls below 5.5. The fluid intake is limited to 2 to 3 pints daily, and mandelic acid, given in the form of its sodium salt (Mandelic acid gr. 45; Sod. bicarb. gr. 21; Syr. aurantii 3 i; Aq. ad 3 i) 180 grains daily.

Twelve out of the 16 cases were completely cured in 5 to 12 days; 2 of the remaining cases were tuberculous and became rid of their secondary infection. There was some tendency to relapse, suggesting that the treatment should be continued for a few days after the urine becomes sterile. Side-effects were occasionally observed, as giddiness, nausea and vomiting, but there were no serious complications.

The excellent results reported were achieved both in chronic cases of as much as 8 years' duration, and in acute cases of severe pyelitis of only a few days' duration which had not responded to the more usual methods of treatment.

W. FORD CONNELL

One Hundred Patients with Staphylococcus Septicæmia Receiving Bacteriophage Service.

MacNeal, W. J. and Frisbee, F. C., *Am. J. M. Sc.*, 1936, **191**: 179.

The authors have treated 100 cases of staphylococcus septicæmia with bacteriophage intravenously. They believe, as a result of this large series of treatments that the "phage" definitely influences the course of the infection. It would appear to be nearly always helpful and sometimes life-saving. In the series, 75 patients died and 25 survived, a considerable reduction in the usual mortality.

The technique is as follows: A blood culture is taken at once and preparation of a specific "phage" begun by subjecting the culture of the organism from the patient's blood to lysis by a mixture of stock phages. The filtrate of this lyzed culture contains a potent bacteriophage adapted to the specific organism as well as specific bacterial proteins. The preparation of this specific phage, including sterility tests, requires from 2 to 8 days. During this interval of waiting the stock phage is employed as follows: The initial intravenous dose is 0.5 c.c. or as high as 2 c.c. if the colony count of the blood is very high. The doses are given at intervals of 45 minutes, increasing the amount by one c.c. at each injection until 10 c.c. is reached, and then continuing as 10 c.c. doses until a total of 100 c.c. has been administered or until shock has occurred (indicated by rise in temperature and chill). After shock the patient receives no further phage till the following day, when he receives, morning and evening, half the dose given just before shock occurred. When the specific phage has been prepared the whole procedure is repeated. The treatments are

usually continued twice daily for at least a fortnight after the blood culture is negative, and once daily for another month. When the patient is allowed out of bed subcutaneous injections are recommended twice weekly for a period of three to six months. Patients who cannot be "shocked" usually offer a poor prognosis. The intravenous injections are combined with local phage treatment of any accessible lesions.

E. S. MILLS

Pathology and Experimental Medicine

Iron and Its Utilization in Experimental Anæmia. Whipple, G. H. and Robscheit-Robbins, F. S.: *Am. J. M. Sc.*, 1936, 191: 11.

This paper is a further report on the utilization of iron in experimental anæmia. In the present investigation the same standard technique in determining hæmoglobin production was used. Dogs were fed upon a standard maintenance diet and bled weekly so as to keep their hæmoglobin at a fairly fixed low level. Hæmoglobin production was, therefore, equal to the hæmoglobin removed by bleeding. The effect on hæmoglobin production of various substances added to the standard diet was measured by the increase or decrease of hæmoglobin in the amount of blood which must be removed to maintain the same hæmoglobin level.

When iron in the form of a colloidal solution of ferric hydroxide was given intravenously to these standard anæmic dogs, either in large or small doses 8-50 mgs. daily, it was returned quantitatively as new-formed hæmoglobin on the basis of 3 g. of hæmoglobin for every 10 mg. of iron injected. This is the computed theoretical equivalent. However, when iron was given by mouth to these standard anæmic dogs the influence on hæmoglobin production was not proportional to the amount of iron administered. The optimum dose of iron by mouth was found to be 40 mg. of iron per day. With this dose the net output of hæmoglobin was about 35 per cent of the calculated theoretical value for the hæmoglobin, if all the ingested iron were utilized. With larger doses the hæmoglobin output increased but the increase was not proportionate to the increase in the iron given. Thus when 400 mg. of iron were given daily by mouth only about 5 per cent was utilized, as compared with 35 per cent when 40 mg. were given daily. The iron contained in the standard diet was utilized by the experimental animals in the same proportion as was iron fed by mouth. Iron in normal liver may show a slightly higher utilization of this tissue iron. When liver feeding was combined with iron feeding by mouth there was a definite summation effect, but this effect did not obtain when the inorganic iron was given intravenously. It would appear that the top functional capacity of the body to produce hæmoglobin is reached by the intravenous dose alone. Liver iron can, therefore, not add

to the effect. This top capacity appears to be about 10 g. of hæmoglobin per day. The quantitative utilization of iron is independent of the type of iron used. Iron in the ferrous, ferric and reduced states appears to have equal hæmoglobin-producing value. The determining factor is the amount of the iron metal.

Finally, the authors have studied iron utilization in animals subjected to splenectomy and to the Eck fistula or to both. Either or both these procedures lessens the capacity of the anæmic dog to utilize iron given intravenously for the production of hæmoglobin. They suggest that this lessened effect may be due to removal of reticulo-endothelium active in the storage and metabolism of iron. Under such conditions the animals may be unable to conserve iron adequately and consequently excrete it by way of the large bowel.

E. S. MILLS

Carcinoma of the Stomach in Identical Twins.

Millitzer, R. E., *Am. J. Cancer*, 1935, 25: 544.

About 40 instances of the same type of tumour in identical twins that have been collected from the literature are mentioned. This is the first instance in which cancer of the stomach has been reported in identical twins. The patients were men aged 70, strikingly alike in appearance as well as in respect of their history. Both were carpenters, both had suffered from bilateral inguinal hernia, which had been repaired in both instances; both had suffered from a recurrence of their hernia after operation, and had been operated upon the second time. Both began their final illness at approximately the same age, one in October, 1933, the other three weeks later in November, 1933. Loss of appetite, and inability to swallow food, especially solid, was the first symptom. In one, the blood sugar was 82 mg. per 100 c.c. of blood, in the second it was 90.9. In the first, the hæmoglobin was 68 per cent, in the second it was 65. In the first the non-protein nitrogen of the blood was 35.9 mg. per 100 c.c. of blood in the second it was 64.5. The first was admitted to the hospital in February, 1934, and died in June; the second was admitted five days later and died in April. The life of the first was prolonged through an operation which enabled him to take nourishment for a longer period of time. The cancer in both was situated in the fundus of the stomach, invading the œsophageal opening, and in both the pathological picture of the tumour was the same. The occurrence of the same type of tumour at the same age, in the same location, in identical twins bespeaks the hereditary nature of the affliction.

(Note: The extreme age at which these patients developed carcinoma of the stomach again bespeaks its hereditary nature. Less than 5 per cent of patients with stomach cancer develop it after 70; hence the fact that both

twins showed it at this age, which is 15 years later than the highest age incidence of stomach cancer, shows that not only the factor for tumour-growth but that for age of onset are largely determined by heredity.)

MADGE THURLOW MACKLIN

Hygiene and Public Health

Active Immunization Against Poliomyelitis.

Brodie, M. and Park, W. F., *Am. J. Pub. Health*, 1936, 26: 119.

Brodie and Park dispute Flexner's statement to the effect that no evidence has been produced to show that germicidally inactivated virus will engender immunity. They maintain that their method of formolizing the virus for the minimum time necessary to render it non-infective does not destroy entirely its antigenic properties. With the use of a virus prepared in this way serum antibody can be produced in monkeys.

The great difficulty in establishing the value of a procedure against poliomyelitis is the relatively small number of susceptible individuals, which requires a very large number of injections to provide an experiment of statistical significance. The authors estimate that some 60,000 children should be inoculated before conclusions could be reached as to the efficiency of this vaccine. Actually some 7,000 children have been vaccinated, of whom 1 developed poliomyelitis after a single dose. Of a smaller number of control children 5 contracted the disease.

FRANK G. PEDLEY

Vaccination Against Acute Anterior Poliomyelitis.

Kolmer, J., *Am. J. Pub. Health*, 1936, 26: 127.

Kolmer's vaccine consists of attenuated living virus. Approximately 11,000 persons have been vaccinated, of whom 10 developed poliomyelitis after 1 or 2 doses. The author gives the case histories of these 10 cases. He is of the opinion that there is no evidence to suggest that these patients were infected by the vaccine, but believes that they were incubating the disease when the vaccine was given, since they were living in epidemic areas.

In the discussion following the reading of this paper, Dr. J. P. Leake, of the U.S. Public Health Service, disagreed with Dr. Kolmer as to the harmlessness of this vaccine, and expressed the opinion that it should not be used for human vaccination. He based his opinion first on the relatively high attack rate, i.e., 10 cases in 11,000 persons; secondly, on the occurrence of the paralysis either in the limb injected or the corresponding limb of the opposite side; and, thirdly, on the period of time between vaccination and onset, which was between 6 and 14 days.

FRANK G. PEDLEY

Obituaries

Dr. Duncan Allison, of Welland, Ont., died on March 15, 1936, from a heart attack. Dr. Allison was born in Canada, and was of Dutch-Scottish descent. Prior to the Great War he was in partnership with the late Hon. Dr. Forbes Godfrey, at Mimico. About 1916 he went overseas from Toronto with a draft of doctors and nurses, and was appointed captain in the Canadian Army Medical Corps. Following the war, Dr. Allison took up residence at Welland, and for many years had been coroner for the district. He was appointed Welland County Jail physician in 1923 and was also physician for a number of Welland industrial plants.

Dr. Allison was a graduate of the University of Toronto (1908). He is survived by his wife.

Dr. Charles Arthur Baragar, Commissioner of Mental Institutions and Director of Health for the Province of Alberta, died in Edmonton on March 8, 1936, from pneumonia, at the age of 50 years.

Dr. Baragar's life was an eventful one. Following public and high school education, he took his bachelor of arts degree at Manitoba University in 1910, and his M.D., C.M. in 1914. Subsequently he was assistant medical superintendent at Ninette Sanitarium. In February of 1915 he joined the Canadian Expeditionary force, and arriving in England was made officer for hospitalization for the London area. Other and important appointments followed, including that of admitting officer of the Third Canadian casualty clearing station, and second in command of the Canadian special hospital at Lenham, in Kent. He held the rank of major.

Following the war Dr. Baragar took post-graduate courses in London, New York and Boston in neurology and psychiatry. He was appointed superintendent of the mental hospital in Brandon, Man., on January 1, 1920, which position he held until August, 1930, when he went to Ponoka, Alberta, in a similar capacity. Then followed further recognition of his efficiency and worth by his appointment as Commissioner of Mental Institutions and Director of Health for Alberta. His devoted wife pre-deceased him in the fall of 1930, her name being perpetuated in Brandon by the Eugene Baragar memorial medal, presented at graduation to the nurse who by her work and progress is deemed worthy of the honour. Three children are left.

Dr. Charles Bayne, District Medical Officer of Health for Sydney, died on March 20, 1936, at the early age of 40 years. He was born in Halifax and graduated from Dalhousie University. Following graduation he was on the staff of the Kentville Sanatorium for seven years before proceeding to Sydney in 1928 where he practised for two years. Following this he was appointed Health Officer which position he held until the time of his death.

Dr. Adélard Clark died in Quebec on February 27, 1936. He had practised for nearly forty years and had become widely known through his professional and personal qualities.

Dr. Norbert Cloutier, aged 58, a well-known Quebec physician and first general vice-president of the St. Jean Baptiste Society, died in Quebec on April 4, 1936. He was outstanding in patriotic and welfare work.

Dr. Matthew Edward Commins, of Bath, N.B., died on April 6, 1936. His death followed shortly after an extremely fatiguing drive over almost impassable roads, a large part of which trip was made on foot. Dr. Commins was born in St. Stephen 66 years ago. He was educated at St. Joseph's University, from which he received his B.A. and M.A. degrees. He graduated in medicine from McGill University in 1895, and practised in the one locality for 40 years.

Dr. Emma Connor, of Belleville, Ont., died on February 16, 1936. She was a graduate of the University of Toronto (1902).

Dr. J. Albert Côté, died on March 20, 1936, after a short illness. Born at Sainte-Pierre de l'Île, he studied at the seminary of the University of Laval and entered the University in 1928. He began his practice in 1933.

Dr. Frederick Thomas Dunlop, of Saint John, N.B., died on March 16, 1936, two weeks after his original attack of cardiac thrombosis. Dr. Dunlop was 56 years of age, and had practised in Saint John for the last 25 years. He was born in Saint John in 1880, educated in the public schools, and graduated from McGill University in 1909. During his whole medical life he was connected with the Saint John General Hospital, first as an intern, then as pathologist, and finally as a junior surgeon. During the World War Dr. Dunlop was a Captain in the C.A.M.C. and acted as an examining officer for recruits in the Province of New Brunswick. Along with his hospital work, Dr. Dunlop had a very large private practice in which he met persons in all grades of society, and his kind-hearted attitude to the sick made him, in truth, a much loved physician. This fact was abundantly made plain at his funeral, which was most largely attended, and at which every attendant was a real mourner.

In his medical associations Dr. Dunlop was a real friend, a delightful companion, and it can be said of him that never did his tongue add to the burden or to the worries of a fellow practitioner. He is survived by his wife, two sons and one daughter. A.S.K.

Dr. Albert Ernest Forbes died at Moncton, N.B., on March 17, 1936. Dr. Forbes was in his 60th year. He was born in Nova Scotia, the son of the late Rev. J. F. Forbes, educated in Sydney High School and Pictou Academy. He graduated in medicine from Dalhousie University in 1900. He practised in Sydney, N.S., Stewiacke, and Maccan. Dr. Forbes came to Moncton in 1920 and has been prominently associated in the medical circles in that city since that time. He was a district coroner and a member of the City Hospital staff. He was a member of the Canadian Medical Association and of the Moncton Medical Society. He is survived by his wife, formerly Gertrude Rutherford, and three sons.

Dr. J. Anthime Gadbois died suddenly on February 20th at his residence in Outremont, Que. He was born on December 10, 1845, at Saint-Antoine-sur-Richelieu, and studied at the seminary of St. Hyacinthe. He first practised at Saint-Marc du Richelieu, and next at Sherrington. He then settled in Montreal, where he worked for many years. Dr. Gadbois leaves a highly respected name both in family and public life.

Dr. Oswald Adhémar Gagnon, of Montreal, died on March 3, 1936, at the age of 50. Dr. Gagnon was titular professor of operative medicine at the University of Montreal and chief of the Surgical Service at the Notre Dame Hospital. He was also honorary president of the Surgical Society and life-governor of the Notre Dame Hospital. He had been president of the Medical Society of Montreal and also of the Medical Bureau of the Notre Dame Hospital. Dr. Gagnon had been ill for many months, and had undergone an operation at the Notre Dame Hospital in December, 1934. He was a graduate of the College of Montreal, took his degree in medicine from the University of Montreal in 1911, and after studying in Europe returned to practise in his native city.

Dr. Joseph Guérard died on March 10, 1936, at the Hôtel-Dieu in Quebec. Dr. Guérard was born in 1865 at Saint-Laurent. He took his classical studies at the Seminary of Quebec where he was a brilliant

student. He won the Prince of Wales' prize at the end of his classical course. He studied medicine at the University of Laval and graduated in 1890. After establishing himself at St. Roch in Quebec he practised there for 46 years. He was Medical Superintendent of the Hôpital Laval in 1908, and was appointed professor of the University of Laval in 1916, where for ten years he held the Chair of Pathology and Therapeutics, and then became the Professor of Clinical Medicine. He was a member of the University Council. His career was a long, useful and brilliant one.

Dr. Joachim Guinane, of Toronto, died on March 12, 1936, aged seventy-one. Dr. Guinane was educated at De La Salle and St. Michael's College, graduating in medicine from the University of Toronto in 1887. He did post-graduate work in England and Ireland, where he was attached to the staffs of St. George's Hospital, London, and Rotunda Hospital, Dublin. He had been prominent in medical circles here for nearly 40 years. He had been connected with St. Michael's Hospital since its inception and was chairman of the advisory board.

Dr. Guinane was a member of the Royal College of Surgeons of England and the Academy of Medicine. During prohibition days he served as license commissioner in Toronto. He is survived by four children, Mrs. L. D. Sullivan, Helen, William and James, all of Toronto.

Dr. Germain Laperrière died on February 15, 1936, at his parents' residence at Lauzon, Que., at the very early age of twenty-nine years. He had graduated only the previous year and seemed to have a brilliant future before him. He studied first at the College of Lévis and took his medical course at the University of Laval, Quebec.

Dr. Frederick Ernest Lawlor, Dartmouth, N.S., died suddenly on January 23, 1936, in Bermuda, whence he had gone, on the way to Barbados, to recuperate after the shock of his wife's death.

The late Dr. Lawlor was born on March 10, 1878, the second son of Edward and Isobel (Lyle) Lawlor, of Dartmouth, N.S. His father was associated for many years with the firm of John Tobin and Company. His mother was a daughter of Alexander Lyle, Esq., who was a well-known Nova Scotian ship-builder, and in his earlier life, in partnership with Samuel Cunard, the founder of the Cunard Steamship Line.

Dr. Lawlor was educated in private schools in Halifax and entered McGill University in 1897. He received his medical degree in 1901. Immediately after graduation he was appointed Assistant Physician to the Nova Scotia Hospital for Insane, Dartmouth, and, a few years later, on the death of Dr. McKenzie, he became Assistant Superintendent. In 1911, on the retirement of the late Dr. W. H. Hattie, he was appointed Superintendent and retained that appointment until the spring of 1935, when increasing ill health made it impossible for him to continue his duties there.

In October, 1906, Dr. Lawlor married Miss Muriel Milliken, daughter of the late Edward and Ellen M. Milliken. After a prolonged illness Mrs. Lawlor died January 3, 1936, at the Halifax Infirmary where both she and her husband had been patients for some weeks. Dr. and Mrs. Lawlor had no children.

Dr. M. G. Burris, of Dartmouth, writes of him: "Dr. Lawlor's sympathy for the many patients under his charge, his understanding of their problems and troubles, and, above all, his genuine concern for their comfort and welfare, were outstanding qualities of his stewardship. He was a diffident man and perhaps few, excepting his patients and associated officials, knew the full truth concerning his character and the value of his work. With his passing the sense of personal loss is great, but greater still, by far, is the loss to this Province of one who will long be ranked among her ablest and most devoted servants."

Dr. Rosario Lessard, of Montreal, died on March 9, 1936, in his forty-sixth year. He was a graduate of the University of Montreal (1914).

Dr. John Roderick Bethune MacLeod, of Port Hawkesbury, N.S., died on January 17th. He had been in ill health for some time, suffering from his heart. He was born in 1884 and was a native of Grand River. He was a graduate of Dalhousie University (1911) and had practised at Port Hawkesbury for twenty-five years.

He is survived by his widow and one son, who is now a second year medical student at Dalhousie University.

Dr. Archibald McDermid, of Severn Bridge, Ont., died on March 17, 1936. He was born in 1859 and was a graduate of Trinity University (1898). He is survived by a son and daughter.

Dr. Hugh Alexander McKay, Superintendent of the Ontario Hospital at New Toronto, Ont., died on February 14, 1936. Born in Bruce County in 1884, he graduated in medicine at the University of Toronto (1914) after working his way through by serving in a bank. During the Great War he served overseas with the C.A.M.C., and on his return to Canada became interested in psychiatric research, entering the service of the Ontario Government in 1921. Before receiving his appointment at New Toronto, he served on the staff of the Ontario Hospital, Hamilton, and that in Toronto.

Dr. McKay is survived by his widow, father and one brother.

Dr. Albert Marois, joint coroner of the District of Quebec, died at Quebec on April 9, 1936, after a short illness, at the age of 75 years.

Dr. Marois was one of Quebec's most prominent physicians and had been surgeon at the Hôtel-Dieu many years.

He studied at Laval University from which he graduated (1882). In 1907 he was created a Knight of the Order of St. Gregory the Great, and was also honoured by King George on the Silver Jubilee of his late Majesty.

Dr. George Sidney Mothersill, D.S.O., of Ottawa, died on February 18, 1936, two weeks after being overcome by carbon monoxide in his garage. He was a graduate of McGill University (1902) and a Licentiate of the Medical Council of Canada, and a war veteran. On the out-break of the Great War Dr. Mothersill enlisted with the 8th Battalion in Winnipeg. He was wounded in the first gas attack at Ypres in 1915. He was appointed assistant inspector of military drafts, and while again on active service was wounded in the Battle of the Somme, in 1916. He is survived by his widow, the former Isabel Carmichael; his son, John Sidney Mothersill; his sister, Gertrude Mothersill, and his mother, Mrs. G. A. Mothersill.

Dr. Hugh Wiley Peppers, of Centreville, N.B., died of heart disease on April 5, 1936. Dr. Peppers was born in York Co., N.B., in 1870. He was educated at the University of New Brunswick (B.A.) and at McGill University (M.D., 1899). He had practised in Centreville since 1899. He is survived by his wife, one son, and one daughter.

Dr. William Ness, of Westmount, Que., died on February 27, 1936, after a protracted illness. He was born in 1877, and a native of Howick, Que.

Dr. Ness attended McGill University after receiving his primary education at Huntingdon, Que., and received his medical degree from the University of Edinburgh (1903). Between 1904 and 1920 he practised in the United States. He had been in Montreal since 1920.

In 1918 Dr. Ness joined the Canadian Army Medical

Corps and became major in charge of the Quebec district. He served successively on the staffs of St. Mary's Hospital, Lewiston, Me., and the western division of the Montreal General Hospital.

He is survived by his wife, formerly Beatrice Phaneuf of Lewiston; two sons, Alex. and Albert Farneth Ness, of Montreal; three sisters, Mrs. Alex. MacIntosh, of Edmonton, Mrs. R. B. Anderson, of Winnipeg, and Mrs. J. R. Bass, of Wilton, Me.; and six brothers, including Prof. A. R. Ness of Macdonald College.

Dr. William Reid, of Wyoming, Ont., died at the home of his sister in Watford on February 4, 1936. Although not in the best of health during the past six months, it was only the past two weeks that he showed signs of severe illness.

After receiving his early education in the Watford Public School, Dr. Reid attended the Strathroy Collegiate. In 1904 he graduated from the University of Toronto in medicine. In 1905 he took over the practice of the late Dr. Harvey in Wyoming, which he successfully conducted until the time of his death.

Surviving are two sisters, Miss Mary and Miss Effie, of Watford.

Dr. Milton Herbert Reynolds, of Ottawa, well known as an eye-specialist, died on February 12, 1936.

Dr. Reynolds graduated from Queen's University in 1905 and had been practising in Ottawa for the past twenty-five years, where he was in partnership with his brother, Dr. B. C. Reynolds.

Born at Mariposa, Ont., February 14, 1881, he was a son of the late Rev. W. E. Reynolds, a Methodist minister, and his wife, the late Lilly Gray. As a child he lived at Pakenham, Cardinal, Lansdowne, Athens and Kemptville, where his father had charges and it was in these communities that he received his early education.

He was married to Minnie B. Jardine, daughter of the late G. F. Jardine, of Newington, sixteen years ago last June.

Besides his widow, he leaves to mourn his loss two children, William, aged 14, and Joyce, aged 9, both at home; one brother, Dr. B. C. Reynolds, of Ottawa; and one sister, Mrs. Melville Sands, of Bartlesville, Okla.

Dr. William Oliver Rose. By the death of Dr. W. O. Rose on March 4, 1936, British Columbia has lost a brilliant medical man and an outstanding citizen in every sense of the term. A native of Prince Edward Island, he taught school first in his native province and subsequently in Manitoba before entering on the study of medicine.

Dr. Rose had a brilliant career as a student and graduated with the Holmes Gold Medal from McGill in 1898. After serving on the resident staff of the Royal Victoria Hospital he made his way to Nelson, B.C., then a small mining town and one which he saw grow into the modern progressive city it is today. As a practitioner he had the faculty of winning the confidence and the affection of his patients to an unusual, indeed, a rare degree. Possessed of unusual gifts of mind and heart Dr. Rose was at once a keen diagnostitian, an excellent surgeon, and a wise counsellor and friend to thousands of people who sought his aid in many ways.

He was a many-sided man. He had a phenomenal memory, and could call by name practically every man, woman and child in the town and for a long distance beyond. He was keenly interested in all the pursuits which make for the enrichment of life, and he is known to have assisted more than one student to obtain his university education. His benefactions were innumerable, and usually of that order in which the left hand knoweth not what the right hand doeth. There was no phase of community life which was not his concern. Alderman, mayor, member of parliament were public offices in which he served with distinction. His membership on the Public Library Board placed his wide knowledge of

books at the disposal of the citizens in building up a fine civic library. While not primarily a business man, his support was often sought, and never in vain, for any enterprise that promised development of sound industry in the city.

On the day of his funeral the life of the city paused to pay tribute to a very distinguished citizen. Those who had known and loved him came in such numbers to pay a last token of respect that the Pro-cathedral where the service was held did not afford standing room to those who sought entrance.

The name and memory of Dr. Rose will long be cherished by the citizens of Nelson and District whom he served so long and so well. F.M.A.

Dr. James Semple, of Kisbey, Sask., died suddenly on March 17, 1936. He was born in Ontario in 1868. After teaching several years in the public schools he entered on the study of medicine, graduating at Trinity University, Toronto, in 1894. For some years he practised in North Dakota. He then moved to Saskatchewan, where he acquired a large practice at Kisbey, at the same time operating a farm. Dr. Semple was a widower, his wife having predeceased him several years ago.

Dr. Arthur Tétrault died suddenly on February 11, 1936, of an angoral attack at his residence at Tétraultville, Que. He was forty-nine years old and was born at Saint-Jacques le Mineur. He graduated in medicine from the University of Montreal (1912).

Dr. George D. B. Watters. The medical profession of Quebec has recently lost one of its oldest and most respected members in the person of Dr. George D. B. Watters, who died on March 10, 1936, at the age of 85 years. He was born at St-Augustin on August 22, 1850, was at the Seminary of Quebec, and studied medicine at the University of Laval (M.D., 1875). He started practice at St-Augustin in 1875 where he remained till 1901. He had been assistant registrar of the French journals of the Legislative Assembly in the Quebec Legislature since 1918, and for many years was a major in the 81st Battalion.

News Items

Great Britain

Royal Society Research Fellowships in Medicine.—

Applications are invited by the Council of the Royal Society for the E. Alan Johnston and Lawrence Research Fellowship in Medicine, tenable in any hospital or medical school in the British Isles. Candidates should supply the usual personal details and give the names of two referees. Testimonials will not be considered. In the case of applicants at a distance referees may write directly. The subject of the proposed research, and the place at which it would be carried out, together with the name of the Head of the Department, should be given.

The appointment will be for two years in the first instance, from October 1, 1936, and will be renewable annually to a total of 5 years. It will be subject to the conditions governing Royal Society Research Appointments. The stipend will be £700 per annum, with superannuation benefits.

Applications, to be addressed to the Assistant Secretary, the Royal Society, Burlington House, London, W.1., should be received as early as possible, and not later than Saturday, June 6th.

The Hunterian Society's Gold Medal for Practitioners.—Any registered general practitioner resident within the British Empire is eligible to compete, and the

Medal, which is of gold, is awarded annually to the writer of the best essay on a subject selected by the Society.

Competitors—men or women—must be engaged in general practice and essays should be sent in by December 31st.

The essay must be unpublished and original, and be based on the candidate's own observation, but it may contain excerpts from the literature on the subject, provided that reference be made to the articles from which they are taken.

A copy of the Rules and any further information can be obtained on application to the Honorary Secretary, Mr. Arthur Porritt, 27 Harley Street, London, W.1.

The subject selected for the essay is, for 1936, "Rheumatoid arthritis—its diagnosis, treatment, and end results"; for 1937, "The prognosis and care of heart disease in general practice."

The prize essay for 1935, on the "Conduct of midwifery in general practice", was written by Francis Bennett, M.D., Ch.B., of Christchurch, New Zealand, and he has been awarded the Gold Medal for 1935. This is the first time the Medal has been awarded to a practitioner resident outside of Great Britain.

Alberta

The Alberta Legislature during its present session amended certain Acts and formulated others within the realm of health measures. These are as follows. "The Municipal Hospital Act" has been amended, permitting a non-resident rate-payer, by paying the hospital tax, to receive all the benefits of the hospital, as though he were a resident.

"The Mental Diseases Act" is amended to provide for the committal of a drug addict to a mental hospital without having to prove that the addict is dangerous to be at large.

"The Workmen's Compensation Act" is amended, giving the Board discretionary powers to extend the period prescribed for reporting the occurrence of hernia. The Board may also take from the Medical Fund sufficient to keep any apparatus furnished an injured workman in repair as long as the disability continues.

"Cardston and Myram Municipal Hospital Districts" are validated, and thus provision for their maintenance is legalized.

"The Hospitals Act" is amended, and provides for the hospitalization of any residents in cases of sudden and urgent necessity. This is made to include maternity cases on the certificate of the attending physician. The District Court Judge fixes the financial responsibility for the costs of the care.

"An Act Respecting the Prevention and Treatment of Tuberculosis". Full power is given the Minister of Health to make provision for the care and treatment of tuberculous patients. Any person who has been resident in the province for twelve successive months out of the immediately preceding 24 months shall receive hospitalization and treatment without fee or charge. All others will have to pay if they have the means.

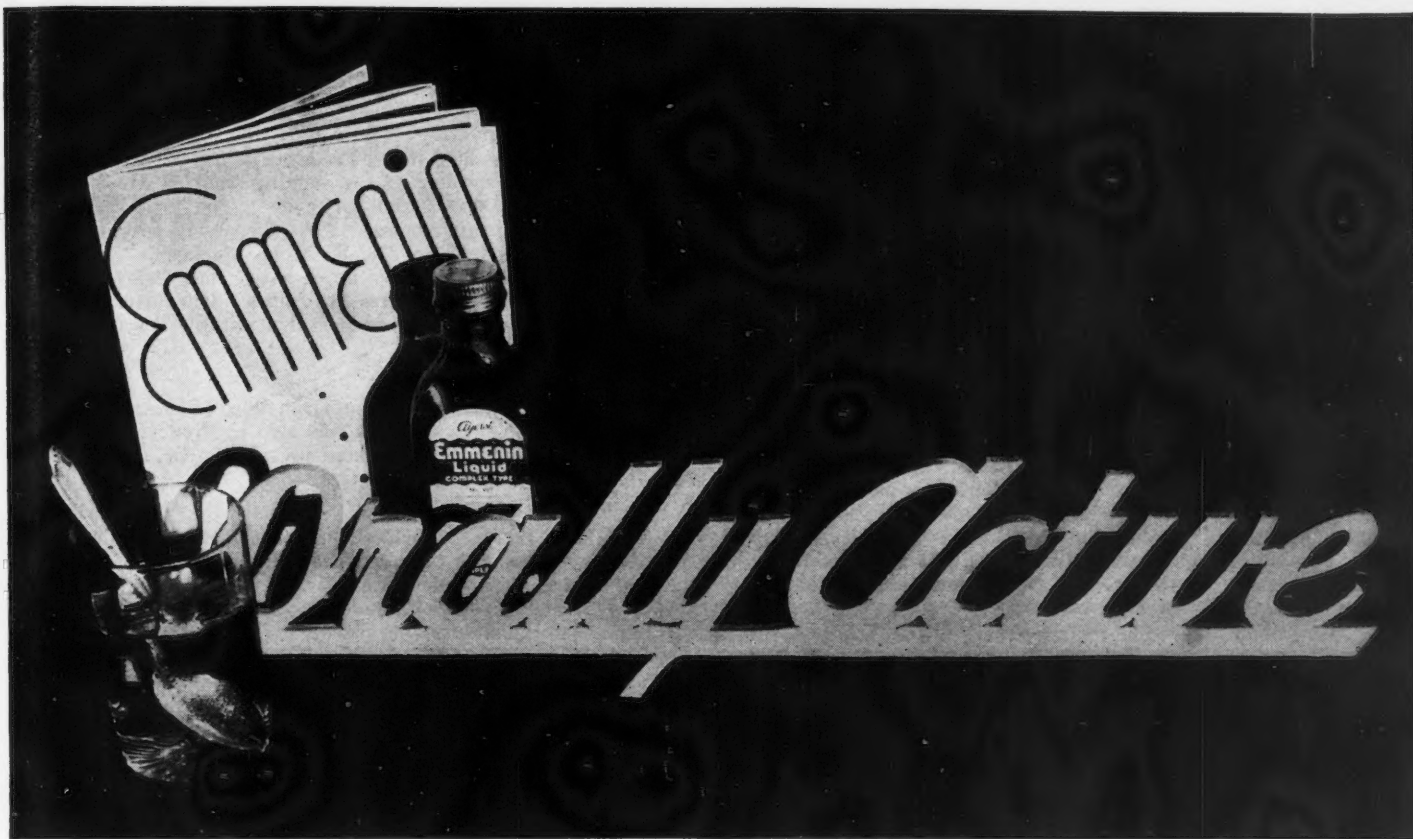
"The Public Health Act" is amended to prohibit unqualified persons treating human beings with radium and radon. They must have a qualifying certificate from the University.

"The Chiropractor Act" changes the personnel of the Board, by having four of the five members, members of the Provincial Chiropractic Association.

G. E. LEARMONTH

British Columbia

The Health Insurance bill, as finally amended, passed its third reading in the Provincial Legislature on March 31st. Few bills have had such a stormy passage through the House or produced such dissension within party ranks. It is very evident from comments in the press



EMMENIN

in the treatment of

menopausal symptoms

NOTE
Substantial
Price Reduction
Effective May 1st.

One of the outstanding applications of Emmenin therapy lies in the treatment of menopausal symptoms. Emmenin is particularly effective where the menopausal syndrome is of a milder form and where the symptoms have recently appeared.

≈
≈
≈
The more usual and outstanding symptoms of the menopause—hot flushes, physical weakness and mental irritability,—show satisfactory response to Emmenin treatment. The hot flushes especially, respond quickly, the physical weakness is usually relieved and the patient exhibits a feeling of well-being in contrast to the depressed mental state so often encountered in menopausal cases.

AYERST, McKENNA & HARRISON, LIMITED

MONTREAL

Biological and Pharmaceutical Chemists

CANADA

that very few of the voters in the province are acquainted with what the bill really provides, and that those who are best acquainted with its contents are most outspoken in their opposition to it. Certain groups who have publicly endorsed the bill give evidence of having been prompted what to say and at the same time of ignorance of what it will achieve. The idea appears general among such that the bill will provide adequate medical attention for those who are unable to pay for it, and that by some as yet unexplained manner the amount of sickness is going to be reduced. Since indigents do not benefit in any way by its provisions, and it is a matter of plain fact that morbidity figures have increased in places where health insurance schemes are in effect, it is evident that such expectations will not be realized. Among last-minute features of the bill's passage was the elimination from the bill of a clause definitely limiting the treasury's responsibility to \$50,000 a year, and the elimination, on a motion by Dr. Sutherland, member from Revelstoke, of the limit of \$5.50 as maximum annual per capita fee for medical attendance.

A bill has introduced in the Provincial Legislature by Hon. John Hart guaranteeing the note of the Foundation to the amount of the \$105,000. This was the first concrete step toward the provision of a provincial centre for the diagnosis and treatment of cancer.

Fire at 4 a.m. on March 29th completely destroyed the Royal Cariboo Hospital at Barkerville. The hospital was built about forty-five years ago, and was insured for \$2,000.

D. E. H. CLEVELAND

Manitoba

By a vote of 30 to 13 the Manitoba Legislative Assembly rejected on its second reading a bill to incorporate chiropractors. The chiropractors were condemned out of their own mouths when a member opposing the bill quoted from a circular sent to members of the Legislature by the chiropractors in which it was stated that chiropractors could cure 95 per cent of all diseases and that no diagnosis was necessary. All the members of the Government who were present voted against the bill, and it was stated that the Premier, who was not present, also opposed it.

Radium to the value of \$45,000.00 was recently moved from the Manitoba Medical College to the new quarters of the Cancer Relief and Research Institute on Vaughan Street.

Dr. A. T. Bazin, of Montreal, and Dr. T. C. Routley, General Secretary of the Canadian Medical Association, were welcome guests at Winnipeg on March 6th. They were entertained at lunch by the Winnipeg members of the executive committee of the Manitoba Medical Association, and at tea by Dr. W. Harvey Smith.

Dr. F. W. Jackson, Deputy Minister of Health in Manitoba, visited Minneapolis on March 6th and 7th. He addressed a seminar of the Medical School on March 6th, speaking on "Provision of medical care in western Canada", and was the guest of honour at a dinner given by the Minnesota State Board of Health. On March 17th he spoke before the third annual North Western Women's Conference on "Medical care in social security", addressing an audience of three thousand women.

ROSS MITCHELL

New Brunswick

Dr. W. W. White, of Saint John, was elected president of the New Brunswick Division of the Saint John Ambulance Association at its 24th annual meeting. He succeeds Dr. G. B. Peat in this office.

The regular monthly meeting of the Saint John Medical Society was held in the Admiral Beatty Hotel on March 25th. The speaker of the evening was Dr. H. S. Everett, of St. Stephen, who spoke on "The technical features of blood examination". The discussion following the paper was lead by Dr. R. A. H. Mackeen. Dr. Everett's audience thoroughly appreciated and enjoyed his rather technical but interesting paper. The attendance of out-of-town physicians is still a notable feature at these meetings.

The annual meeting of the Council of Physicians and Surgeons of New Brunswick was held in Fredericton. Dr. G. Clowes VanWart was elected president. Dr. J. M. Barry was re-appointed as registrar.

Dr. P. M. Knox, Superintendent of the River Glade Sanatorium, presented the report of this institution to the legislature on March 11th. Dr. Knox pointed out that the number of patients treated in the institution had again shown an increase, and in his report stressed the necessity for the various municipalities to recognize their obligation towards the rehabilitation and medical treatment of their citizens suffering from tuberculosis.

Lieutenant-Governor Murray MacLaren is to be the recipient of an honorary degree of Doctor of Laws from the University of Edinburgh. This honour to our popular Lieutenant-Governor has been the cause of many congratulations from many of his friends, both medical and lay.

A. STANLEY KIRKLAND

Nova Scotia

The report for the past year for the Department of Health of the province has been tabled in the Legislative Assembly. The chief items of interest are the following: A very satisfactory health year has passed. The general death rate was reduced to a lower level than in the previous year. Common diseases show a very definite decrease, excepting measles and whooping-cough. The infant mortality was the lowest on record. Gains in the control of tuberculosis were shown. No serious epidemics occurred. Most of the principal causes of death, excepting heart disease and cancer, show diminutions. Particularly low levels in mortality rates were observed in typhoid, smallpox, epidemic meningitis, and dysentery. For the third consecutive year there were no cases of smallpox in the province. The death rate from accident causes were 32 less than the previous year.

Figures based on the 1931 census show that there were 22.2 births per 1,000 population—an increase over the previous year of 247. The actual number of living births were 11,407.

The death rate was 11.7 per 1,000, the total for the year amounting to 6,028—a decrease of 17 over the previous year.

There were 3,756 marriages, which also show a definite increase over the previous year.

During the year there was added to the Department a Bureau of Sanitary Engineering headed by a qualified sanitary engineer, recently returned from Harvard where he had studied on a scholarship granted by the Rockefeller Foundation. He will act in an advisory and consulting capacity to local health boards on water, milk supplies and sewage questions.

An increased amount of work in the diagnostic laboratories occurred during the year and this has led to better methods of disease control and a definite improvement in the quality of milk.

The increased usefulness of the health education program largely carried out by the Public Health Nurses in homes and schools was evident during the past year.

In Obstetrical Diagnosis

RADIOGRAPHY and radiographic pelvimetry in obstetrical cases provide a means for the physician to obtain essential anatomical facts in advance of delivery. Radiographs show the position and degree of development of the fetus during gestation. They give graphic information about the type of pelvis and any abnormalities.

Knowledge of all the facts, when

there is suspected or evident disproportion between the fetal head and the mother's pelvis or when an anomaly exists, makes possible the avoidance of needless complications at birth. With many obstetricians it is a routine procedure to refer all patients to a radiologist. You, too, should take advantage of this safeguard and obtain all the facts in every obstetrical case.

CANADIAN KODAK CO., LIMITED, Toronto, Ontario



RADIOGRAPHS
PROVIDE
DIAGNOSTIC
FACTS

The Students Medical Society of Dalhousie University have published their first *Medical Journal* under the editorship of I. Roy Gold. Copies of the journal go to the graduates of the medical school as well as to the under-graduates.

N. B. DREYER

Ontario

In the Government estimates for 1936 there appears an item of \$2,420,000 for general hospitals and charities, compared with \$1,742,500 last year. The sum set aside for Ontario Hospitals (mental) is increased from \$4,248,336 to \$4,344,830.

Dr. James P. Campbell has been appointed Medical Officer for the Separate Schools in the City of Toronto.

The Ottawa Civic Hospital announced the receipt of a bequest of some \$23,000 from the estate of the Honourable Mary Macdonald, daughter of Sir John A. Macdonald. This will be used for the endowment of a four-bed public ward in the Women's Department.

The Honourable Minister of Health has sponsored an Act whereby the Province's contribution for indigent patients in convalescent hospitals is increased from thirty cents to forty cents a day. The municipal contribution under the Act will be increased from ninety cents to \$1.25 a day. This Bill will relieve municipalities of the obligation of providing for the maintenance of nurses who require hospitalization while in training in that municipality. The charge will be levied against the municipalities from which the nurses come.

An amendment to the Sanatoria for Consumptives Act provides for care of "maximum improved cases" outside of sanatoria. For the care of these under properly supervised homes, the municipal liability will be \$1.25 a day and the provincial contribution 40 cents a day for all indigents.

The Lister Memorial Hospital has had for three years a hospital-care contract. Under a personal contract for \$5.00 or a family contract for \$10.00, the hospital is obliged to give two weeks' hospital care free. This includes hospital nursing, board and room, and the best hospital care that can be given. It does not include operating-room expenses, doctors' fees or medicine. The hospital and community appear to be satisfied with the results over a period of three years.

H. C. Parsons, B.A., M.D., C.M., M.R.C.P., has recently been elected to Fellowship in the Royal College of Physicians of London.

J. H. ELLIOTT

Quebec

There is now before the Quebec Legislature a Bill designed to confer on chiropractors in the Province of Quebec, the right to teach chiropractic and legally to practise in the province. There is nothing new about this attempt to gain legal recognition, for it has been repeated again and again both in Quebec and in other provinces of Canada. We need hardly remind our readers of a recent similar effort on the part of the osteopaths in Great Britain. No such attempt has yet succeeded, we are glad to say. But we must not be too complacent. If there is one quality possessed above all others by these people it is persistence. They know only too well—is not their whole method built upon it?—the extreme gullibility of the public, and the inability of the layman usually to distinguish between their mere claims to knowledge, and genuine desire and effort to acquire scientific knowledge. Hence the cloud of obscure buzzings with which they surround their manipulations. These would be no more than ludicrous if they did not

so often become dangerous; witness, as but one example, their serene and persistent manhandling of a tuberculous spine.

Here, however, we are not concerned with the arguments against chiropractors. When men are so determined to exploit innocent ignorance then reason has a long fight ahead of it. All we would do at the moment is to draw attention to this latest attempt to gain recognition of a completely discredited method of healing, and to say what is being done to combat it. The various medical societies and teaching bodies in the province have been advised of the Bill, and will be represented at the meeting of the Committee to which the Bill will be referred. The Montreal Medico-Chirurgical Society, in sending its views on the matter to the College of Physicians and Surgeons of Quebec, has suggested that an effort should be made now to deal with this whole question of cults and drugless healers in such a way as to protect the community once and for all from all their future attempts to gain legal recognition. This could be done by making it requisite that those professing such cults should attain a standard of cultural and technical education comparable with the education required of the members of the medical profession. It is pointed out that the Ontario Drugless Practitioners' Act of 1925 is an example of such successful legislation, and might well serve as a basis upon which to frame legislation for the Province of Quebec.

H.E.M.

Saskatchewan

At the March meeting of the Prince Albert and District Medical Society the first of a series of articles which the Society is preparing for the press was read and passed. One will be prepared for each succeeding monthly meeting. Dr. J. A. McDonald read an interesting paper on "Acute appendicitis", illustrating the variety of signs and symptoms, course, complications, and treatment by numerous case reports.

Miss Mary McCuaig, of the Victorian Order of Nurses, met the Society on March 25th, to discuss the establishment of a branch of the order in Prince Albert.

On Lister Night, Dr. F. W. Hart, of Indian Head, gave an interesting address to the Regina and District Medical Society on "The life of Lord Lister".

The following changes in legislation in the Province of Saskatchewan deserve notice.

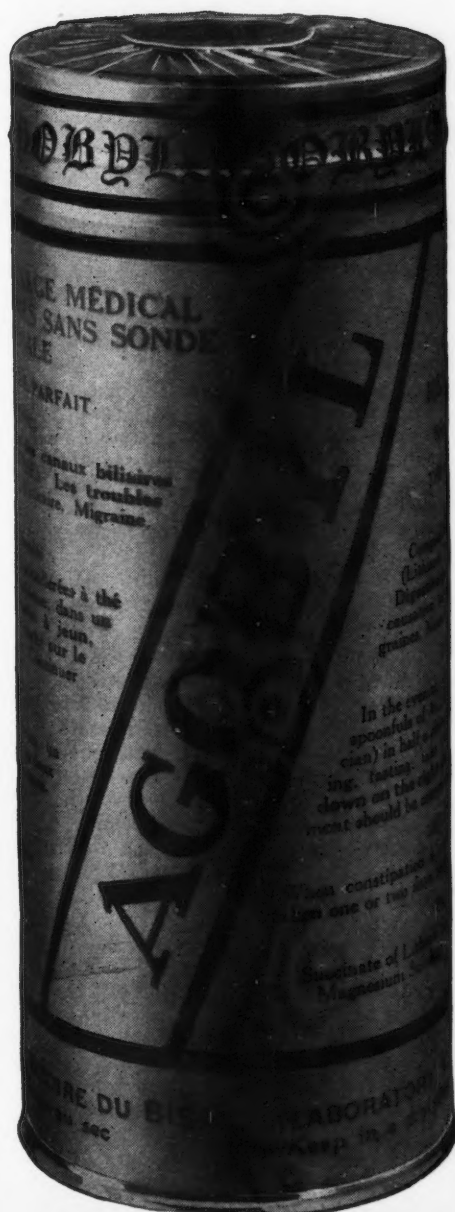
If any animal in a dairy herd is suspected of being affected with tuberculosis or any disease communicable to human beings the Minister of Health may require from the owner of the herd a certificate from a veterinary surgeon stating his findings after he has tested the herd. If any disease is found the owner of the herd cannot offer milk from it for sale.

There shall be a Health Services Board consisting of three or five members, one of whom shall be a representative of the College of Physicians and Surgeons and one a representative of the Saskatchewan Association of Rural Municipalities. The advisory council to this Board consists of the president of the College of Physicians and Surgeons, the president of the Saskatchewan Dental Association, the president of the Saskatchewan Pharmacy Association, the president of the Provincial Council of Women, the president of the Urban Municipalities Association and the president of the Rural Municipalities Association, the president of the Saskatchewan Registered Nurses' Association, the Commissioner of the Saskatchewan Division of the Canadian Red Cross Society, and the president of the Saskatchewan Hospital Association.

No agreement shall be entered into by a municipal council for the provision of medical services or hospital care or nursing or dental services to residents of the municipality, or for the supply of drugs or appliances

ACOBRYL

Soluble
granules
125 grammes.



A cholagogue that is exceptionally effective, indicated in all cases of liver disturbances, acute or chronic icterus, except those of a syphilitic nature, or those where surgical intervention is necessary. Also indicated for chronic cholecystitis, etc.

Mode of Use:

One to three teaspoonfuls of granules dissolved in half a tumbler of tepid water, to be taken 30 minutes before breakfast.

Literature and samples on request.

The BISMOL LABORATORY MONTREAL

DISTRIBUTORS

TORONTO: Drug Trading, National Drug & Chemical Co. Limited.
MONTREAL: Lyman's Limited, National Drug & Chemical Co. Limited.
WINNIPEG and REGINA: National Drugs Limited.
CALGARY and EDMONTON: Alberta National Drugs Ltd.
VANCOUVER: B. C. Drugs Limited.
HALIFAX and ST. JOHN: National-Canadian Drugs Ltd.

prescribed by the municipal physician for such residents unless such agreement has been approved by the Health Services Board.

Any dispute between a council and a hospital board or a municipal physician, nurse or dentist, with respect to the services to be rendered under an agreement, may be referred to the Health Services Board by either of the parties, and if so referred the decision of the Board shall be final and binding.

The mental hospitals have been transferred from the Department of Public Works to the Department of Health. A mental defective has been defined as a person in whom there is a condition of arrested or incomplete development of mind, whether arising from inherent causes or induced by disease or injury, and who requires care, supervision and control for his own protection or welfare, or for the protection of others. A mentally ill person has been defined as a person other than a mental defective who is suffering from such a disorder of mind that he requires care, supervision or control for his own protection or welfare, or for the protection of others.

Allergy was the subject of the March meeting of the Regina and District Medical Society. Dr. J. Lloyd Brown spoke on "Skin manifestations"; Dr. H. C. George, on "Migraine"; Dr. F. J. Ellis, on "Hay fever and asthma"; Dr. Frances McGill, on "Protein sensitization tests".

At the annual convention of the Saskatchewan Association of Rural Municipalities the principle of state medicine was adopted overwhelmingly, and the executive was urged to continue its efforts to have the government put a system into effect as early as possible. The directors outlined the cost of such a plan ranging from \$6,000 to \$60,000 per municipality. As an alternative to a scheme to cover the entire province the directors' report asked that the government be urged to experiment with the practicability of such a system by the establishment of a health district in representative areas of the province, where groups of four or more municipalities would, by vote of the electors, approve of such an experiment being conducted. The report showed that the total annual cost of a scheme for the entire province would be nearly seven million dollars, or \$14.50 per person, basing it on Alberta's calculations. This would mean an average cost to the rural municipalities of \$22,500 a year. The debt of Saskatchewan is now \$46,473,077.93 which is \$51 per person.

The department of health of Saskatchewan has announced that nurses and attendants in government-operated hospitals will this year get six weeks' holidays instead of the usual three weeks, the total is to be split into two periods of three weeks to be taken at different times. The double holiday concession is made in compensation for the twelve hour duty day.

LILLIAN A. CHASE

General

Report of the Banting Research Foundation for 1934-35.—During the year the Board of Trustees was reconstituted, and now consists of the following members: *Chairman*, Mr. C. S. Macdonald, President of the Confederation Life Association; *Vice-chairman*, the Hon. Dr. H. J. Cody, President of the University of Toronto; *Honorary Secretary-Treasurers*, Professors V. E. Henderson and D. T. Fraser; *Members*, Sir William Mulock, Chancellor of the University of Toronto, Dr. H. B. Anderson, Dr. J. G. FitzGerald, Dr. W. E. Gallie and Mr. J. W. Rogers.

Grants which were operative during the year 1934-5 were received by Dr. A. C. Abbott, University of Manitoba, for the study of the thyroid gland; Dr. H. H. Burnham, University of Toronto, for the study of the

anatomy and physiology of the nasal mucosa; A. Cipriani, McGill University, methods for the continuous recording of heart rate and respiration; B. K. Coady, Dalhousie University, a study of the lymphocytes; Dr. A. M. Davidson, University of Manitoba, the so-called "mosaic fungus"; K. A. Evelyn, McGill University, the photo-electric colorimeter and its clinical applications; Dr. R. D. Heard, University of Toronto, adrenalin; Miss C. O. Hebb, McGill University, the relationship between blood-sugar concentration and the external secretion of the pancreas; Dr. W. B. Hendry, University of Toronto, the changes in the ureters during pregnancy; Dr. L. Irving, University of Toronto, carbon dioxide anhydrase; Dr. M. J. Lawson, University of Toronto, the carbohydrate metabolism of the kidney; Dr. T. S. Perrett, and Dr. D. G. Murray, University of Toronto, on the prevention of thrombosis by heparin; Dr. J. Prendergast, University of Manitoba, thyroid studies; Dr. F. Smith, McGill University, on the culture and growth of the streptococcus; Dr. W. H. M. Thompson, University of Western Ontario, the replacement of retinal detachments; Dr. B. M. Unkauf, University of Manitoba, the innervation of the human stomach; Dr. M. C. Watson, University of Toronto, a clinical study of female sex hormones; Dr. S. Weinstein, University of Toronto, the assay of the oestrus-inducing hormone.

Some fifteen papers by grantees appeared during the year, of which the most important were: "An anatomical investigation of the blood vessels of the lateral nasal wall", by H. H. Burnham, Toronto; "The dermatophytes", by P. H. Gregory (with Dr. A. M. Davidson); "The mechanism of adrenaline stabilization", by R. D. Heard. Further, as a result of the grant made to the Department of Medical Research, University of Toronto, under Sir Frederick Banting, eight papers were published, dealing with the enzyme phosphatase, silicosis, blood iodine in health and disease and the phosphoric esters of malignant tissues. Reports that promise further important contributions were also received from the other grantees.

The Trustees wish to acknowledge the cooperation of the Heads of the various Departments in the Universities under whom its grantees have been working, the facilities, encouragement and inspiration afforded them. They regret that the present financial depression has greatly increased the difficulties of many Departments in extending the sphere and scope of the investigations they can afford, and are glad that the Foundation has been able to aid in advancing the solution of so many problems. They regret, however, that the funds at their disposal are not greater so that their assistance might be more widespread.

V. E. HENDERSON,
Honorary Secretary-treasurer.

The hospital of the Missionary Society of the Church of England in Canada at Aklavik, N.W.T., was destroyed by fire on April 6th. The patients housed in the building were removed safely to other sections of the settlement. There was no loss of life. Despite efforts to extinguish the fire, the flames spread quickly through the frame structure, destroying all equipment.

The hospital was erected originally in 1926, and in 1931 a wing was added, bringing accommodation to 18 beds. The building was equipped with electric lights, x-ray apparatus, an operating-room and was fitted to handle emergency cases.

The staff consisted of two graduate nurses, M. A. Solomon and Ruth Hamilton. Dr. J. A. Urquhart, resident medical officer of the Department of the Interior at Ottawa, had jurisdiction over the hospital.

The Pan-American Medical Association has conferred honorary associate memberships upon the following noteworthy non-medical scientists: Dr. William David Coolidge, director of the research laboratories of the General Electric Company, Schenectady, N.Y., and Mr.

*Recommended by the
Medical profession*



for DISORDERS OF THE LIVER,
BLADDER AND KIDNEYS,
RHEUMATISM, ARTHRITIS



BOTTLED UNDER GOVERNMENT SUPERVISION AT THE SPRINGS

**VICHY
Célestins**

Sales Agent: HERDT and CHARTON INC.
2027 McGill College Ave., Montreal 11 King Street W., Toronto

Classified Advertisements

WANTED: a locum tenens in eye, ear, nose and throat for July, August and September in Southern Ontario. Give training, credentials and salary desired. Apply Box 246, Canadian Medical Association Journal, 3640 University Street, Montreal.

LOCUM TENENS or assistantship wanted by graduate from University of Western Ontario, age 28. L.M.C.C. Ontario License. Would like to work for one or more months, July, August, September or October. Reply Box 244, Canadian Medical Association Journal, 3640 University Street, Montreal.

WANTED, situation, part time, in Toronto. Neat, capable male graduate with one year's internship and three years' general practice. Will do anything ethical, night work, laboratory work, keep books, take dictation, look after office and drive. Fifteen dollars or more weekly. Apply Box 248, Canadian Medical Association Journal, 3640 University Street, Montreal.

HOUSEKEEPER, experienced, capable of looking after accounts desires position in doctor's home. Medical references. Apply Box 245, Canadian Medical Association Journal, 3640 University Street, Montreal.

CANADIANA, BOOKS AND PAMPHLETS—Place your name on my mailing list for regular catalogues. Books searched for, and special lists prepared, on any phase of Canadiana, without obligation. Dora Hood's Book Room, 720 Spadina Ave., Toronto.

PHYSICIAN'S LOCATION: ideally located to command attention and encourage practice. Close to active business section and on edge of splendid residential locality. Large farmers' market is also situated nearby. This house, in the opinion of five large real estate concerns, is an outstanding doctor's location and considered one of the best in Toronto. The owner wishes to deal privately. Terms may be arranged. Box 247, Canadian Medical Association Journal, 3640 University Street, Montreal.

A Man Lives Too Long

He Dies Too Soon

if his old age must be spent in poverty and want.

if he has not made proper provision for the continued comfort of his family.

Life Assurance affords protection against each of these possibilities.

By means of one of the easy **SUN LIFE** plans, a man can be assured of an income for his own later years if he lives, or for his family's needs if he dies.

*Your nearest **SUN LIFE** representative will be pleased to draw up a plan to suit your own particular requirements on request.*

SUN LIFE ASSURANCE COMPANY OF CANADA

Head Office

:::

Montreal

Myron Weiss, associate editor of *Time News Magazine*, New York, N.Y.

Dr. Coolidge, physical chemist, was cited for his perfection of x-ray tubes, by which he has vastly promoted the science and art of Medicine.

Mr. Weiss, journalist, was cited in recognition of his outstanding services in disseminating medical and scientific information to the lay public and of his diligent promotion of goodwill among the nations whose medical men compose the Pan-American Medical Association.

The President of the Association is Dr. Alberto Inclan, of Havana, Cuba.

American Association for the Study of Goitre.—The annual meeting of the American Association for the Study of Goitre will be held in Chicago, Illinois, on June 8th, 9th, and 10th.

The president is Dr. J. R. Yung, Terre Haute, Ind., and Dr. W. Blair Mosser, Kane, Pa., is the Corresponding Secretary.

Book Reviews

The Treatment of Rheumatism in General Practice. W. S. C. Copeman, M.A., M.B., B.Ch., M.R.C.P., Hon. Physician, B.R.C.S. Clinic for Rheumatism, Peto Place, London. Second edition, 228 pages. Price \$2.75. Ed. Arnold, London; Macmillan, Toronto, 1935.

The author draws on his experience in a very large and active clinic in London, devoted to the treatment of rheumatism. In the foreword mention is made of the ravages of this disease in the economic life of the country as pointed out by the Ministry of Health. He describes all the conditions which can be classed under the heading of rheumatism, together with an outline of their treatment. The various therapeutic agents are also described in a special section. In this section the author emphasizes several points which seem in many cases to be forgotten in the treatment of this disease. Two of the axioms are that one must have a definite plan for the treatment of each case and also that over-treatment is just as bad as under-treatment.

It is a well written little book and gives the reader confidence in the approach to the diagnosis and treatment of a case of rheumatism. It should be most useful to students and practitioners, not only as an outline of treatment but to stimulate interest in the care of these patients.

The Rheumatoid Diseases. Francis Bach, M.A., M.D., Chief Assistant, St. Bartholomew's Hospital. 436 pages, illustrated. Price \$4.00. Cassel & Co., London and Melbourne; MacAinsh & Co., Toronto, 1935.

During the past few years many investigators have attempted to throw more light on the rheumatic diseases, and the results of their work have been set forth in a number of excellent publications. Considerable progress has been made in determining the cause and in outlining methods of treatment in this, one of the most obstinate forms of chronic disease.

Dr. Bach has divided the contents of his work into three parts: Part I, The Anatomy and Physiology; Part II, Descriptions, varieties and forms of the disease; Part III, Discusses at some length all forms of treatment. There are 26 text figures and 12 excellent plates. There is a good bibliography. In addition, at the end of the book there is a comprehensive table of the principal features of the rheumatic diseases. In the chapter on drug treatment, mention is made of the cinchophen group. In view of

recent investigations one would hesitate to use this class of drug in the dosage recommended. For instance, Atophan, given in 15 grain doses three times a day for three days a week, would seem to be excessive. The work is well printed and is recommended to the clinician or student as a valuable addition to the literature of this subject.

The Study of Anatomy. S. E. Whitnall, M.A., M.D., B.Ch., M.R.C.S., L.R.C.P., F.R.S.(C.), Professor of Anatomy, University of Bristol. Third edition, 113 pages. Price \$1.20. Ed. Arnold, London; Macmillan Co., Toronto, 1936.

There are actually very few books on the teaching of anatomy, which is curious when one considers the peculiar difficulties of the subject. Perhaps it is because it has been for too long assumed that anatomy is no more than a collection of facts which it should always be possible to memorize, more or less. The few who teach anatomy nowadays know differently however; and Professor Whitnall is in the very forefront with those who have helped to bring about this change of heart. His book, it is true, is written for the student, and no other book is likely to excel it in its successful grasp of the student's point of view, but it should also be read by those to whom anatomy represents "Past straits, and currents long steer'd through". To such it will be a revelation of how much can be done to rescue anatomy from the atmosphere of repellent drudgery which has surrounded it in so many students' minds.

Of the articles written on the subject of teaching anatomy there are very few in which the eye is even lifted toward the student himself. Professor Whitnall has kept the balance between the teacher and the taught, shifting from one to the other with admirable judgment and rare and most welcome humour. He has done something else also which cannot be done too often in connection with our medical curriculum. He has dwelt on the value of, nay the necessity for, wider interest in science, and (what is far too readily sacrificed by our students) a keener appreciation of literature and art. Under his guidance anatomy becomes a window through which the student is introduced to a rich background of art of which he should at least be aware; just as the artist who gave us the immortal plates of Vesalius remembered to weave across them the landscape against which his figures stood.

Short Wave Therapy and General Electro-therapy. H. F. Wolf, M.D., Consultant, Department of Physical Therapy, Mount Sinai Hospital. 96 pages, illustrated. Price \$2.50. Modern Medical Press, New York, 1935.

This small volume, well illustrated, as its author says "does not pretend to be a text-book on Physical Therapy." It is, however, a useful elementary introduction to certain aspects of the subject. It is informative and picks out a few highlights in treatment, and in a graphic manner brings to the attention of the practitioner the chief uses of electro-therapy and in a very pertinent way warns the therapist regarding some of the dangers that are encountered in treating disease electrically. If one thinks of this book not as a text-book, but as a synopsis of the chief points in electro-therapy, it may be considered a useful one.

Early Diagnosis of Malignant Disease. Geoffrey Keynes, M.A., M.D., F.R.C.S., Assistant Surgeon, St. Bartholomew's Hospital. 70 pages. Price \$1.00. John Bale, Sons & Danielsson, London; Macmillan Co., Toronto, 1935.

This is one of the best pocket monographs that we have yet seen. The proper emphasis is laid on the right points, and it has none of the verbiage with which writ-

Essentials in **SERUM TREATMENT OF PNEUMONIA**

Determining the Type of Pneumococcus

Successful treatment requires the use of serum specific for the type of the causative pneumococcus. Using the Neufeld rapid method of typing a physician may determine the type in his office with the aid of a microscope or the typing may be done in hospital or other laboratories. A package containing typing sera is now supplied by the Connaught Laboratories. By the Neufeld technique the type may be determined within a few minutes.

Using an Effective Highly Concentrated Serum of Specific Type

Type I or Type II pneumococci are the causative agents in over 50 per cent of all cases of lobar pneumonia and for these type I and type II sera can be effectively employed. The serum is highly concentrated and the difficulties attendant on the use of large doses of unconcentrated antipneumococcus serum have been greatly reduced.

Proper Administration of Serum

Serum is administered intravenously in divided doses over a period of hours. Good results have been obtained when the serum has been administered with the minimum delay and in accordance with the directions. The quantity of serum required in treatment is dependent on the severity of the illness, time of treatment, etc., being on an average 200,000 units. Type I Concentrated Antipneumococcus Serum for treatment is supplied in vials containing 10,000 units and 20,000 units. Type II Serum is similarly supplied.

Outfit for the Rapid Typing of Sputum by Physicians

A package consisting of a supply in capillary tubes of Type I, Type II and Type III antisera sufficient for the performance of 3 tests and a solution of standard methylene blue, with details of the technique, is supplied by the Connaught Laboratories. The cost of the package is 30 cents.

CONNAUGHT LABORATORIES

University of Toronto

TORONTO 5

-

CANADA

ings on cancer are apt to be surrounded. The outlook of the book is well set forth in the sentence:

"At all times it is vital for the patient's welfare to stress the absolute necessity for attention to detail in arriving at a diagnosis and for the doctor to be fully aware of the grave responsibility that he assumes if he chooses to neglect any indication, however slight, of the possible presence of malignant disease".

Our preachings to the public on cancer can never be effective unless the profession follows the exacting demands which are so excellently outlined in this book.

Handbook of Bacteriology. J. W. Bigger, M.D., Sc.D., F.R.C.P.I., D.P.H., M.R.I.A., Professor of Bacteriology, University of Dublin. Fourth edition, 458 pages, illustrated. Price \$3.75. Baillière, Tindall & Cox, London; Macmillan, Toronto, 1935.

In the review of the first edition of this compact book on medical bacteriology, which appeared ten years ago in this *Journal*, there were two adverse criticisms. The first of these, the absence in the introductory chapter of any orientating discussion of the place bacteriology filled in the history of medicine, still holds good. It is an unfortunate omission. The second was the emphasis given to the historically interesting, but long discarded, Ehrlich side-chain theory of immunity, but this has been corrected. An adequate analysis of the fundamental proofs demanded before a given microorganism can be considered as of etiological significance is badly needed. The work of Abel (January, 1934) on the distribution of tetanus toxin by the blood and not by direct passage up the nerves was probably too late for inclusion in this edition, but the smooth and rough types of *B. influenzae* should have been considered. Nevertheless, this text-book is filling a very definite place, particularly for the busy, overworked student of medicine, since it contains a wealth of condensed and reliable facts about the disease-producing bacteria, without in any way discouraging the use of more detailed reference works. The essential technical methods for isolation and identification of the various microorganisms associated with disease are to be found, and the book can be recommended as reliable and, with remarkably few exceptions, up to date.

Immunology. N. P. Sherwood, Ph.D., M.D., Professor of Bacteriology, University of Kansas. 608 pages, illustrated. Price \$6.75. C. V. Mosby, St. Louis; McInsh, Toronto, 1935.

This volume evidently is intended primarily for the use of medical students or those majoring in bacteriology. The author has set forth the subject in a form both concise and easy to read. The absence of small print is a noteworthy feature. Advanced students of immunology may not concur with some of the abbreviated statements, since many of the factors and principles concerned in immunology are as yet not subject to exact definition. Considerable space is devoted to the complement fixation and the precipitin reactions for syphilis and the chapters on hypersensitiveness are comprehensive and contain useful information on this subject. This volume should serve as a useful text-book for the student of immunology.

Medical Mycology. C. W. Dodge, Ph.D., Mycologist, Missouri Botanical Gardens. 900 pages, illustrated. Price \$11.50. C. V. Mosby, St. Louis; McInsh, Toronto, 1935.

This book has grown out of a course of lectures given by the author on the fungous diseases of man and other mammals to the students of Harvard University from 1924 onward. The table of contents shows that its scope is most comprehensive. At the beginning of the work there are chapters on the general morphology of fungi, the physiology and

reproduction of fungi, the preparation of culture media, the isolation of microorganisms, microscopical methods, and botanical nomenclature. In general, the international rules for botanical nomenclature have been followed. The various species, arranged in their proper phylæ are dealt with in great detail, and in the case of the pathogenic forms the diseases in man and the lower animals are described in brief but adequate terms. For the first time in this field a relatively complete and accurate bibliography of existing literature is presented. The author has some cogent and timely remarks on the proper preparation of bibliographies to which all editors will subscribe.

This is a monumental work of great merit and will, we think, for long be the leading book of reference for those interested.

The Bacteriology of Typhoid, Salmonella, and Dysentery Infections and Carrier States. Leon C. Havens, M.D., Director of Laboratories, Alabama Department of Public Health. 158 pages. Price \$1.75. Commonwealth Fund, New York, 1935.

This small volume will prove a welcome addition to the library of every bacteriologist and epidemiologist. Between the covers is much more information than one might infer from the title. One chapter gives a thorough and concise review of the problem of the antigenic composition of the bacterial cell. A further chapter deals with morphological changes and antigenic variations. The identification of intestinal pathogens by cultural procedures is described in detail, and the associated question of the carrier problem is illuminated from the extensive practical experience of Dr. Havens in his investigations of typhoid carriers in Alabama. The book is a tribute to and worthy of the memory of the late Dr. Havens.

A Doctor's Odyssey. A. Gaylord Beaman. VIII and 340 pages, illustrated. Price \$2.50. Johns Hopkins Press, Baltimore; Oxford University Press, London, 1935.

This is a delightful book, particularly for the book lover. It is called "A sentimental record of Le Roy Crummer: physician, author, bibliophile, artist in living." It is all of this. It is more. It is an arresting story of a great character, an inspiring teacher, a beloved physician, and an equally revealing picture of an accomplished and understanding wife. The book begins with A Word in Memory by Mr. A. Edward Newton. Then we have chapters on the Man, Medicine, and Books, followed by appreciative notes by many distinguished personages, friends and colleagues of Doctor Crummer, in which the many-sidedness of his character is well set forth. Then come Miscellaneous Letters, In Memoriam, and a bibliography of Doctor Crummer's own contributions to medical knowledge. Doctor and Mrs. Crummer used to make an annual pilgrimage to Europe in search of rare medical books. We are told many interesting anecdotes about their experiences, and there are many side-lights not only on books but on the many notable people whom they met. They usually came home laden with spoils. We can appreciate their joy when they obtained one of the four known copies of Paré's "Anatomie Universelle du Corps Humain" (1561) and a copy of Harvey's "De Motu Cordis" in large paper and unbrowned (very rare in this state); the first edition of Jenner, autographed by the author to his nephew; the copy of Vesalius's "De Fabrica", inside the covers of which were pasted two anatomical fugitive sheets; the rare Dutch version of the "Religio Medici"; and the original manuscript of "An Introduction to the Study of Physic", by William Heberden, signed by the author.

In this book one regrets to see a number of misspelled words, mostly proper names, but not all. These are perhaps to be attributed to faulty proof-reading, but, again, not all. In a work of this

so they always re-order

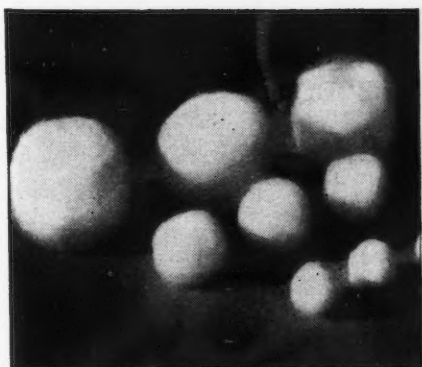
"ZO" Adhesive Plaster

The standard of the world—Unrolls readily from end to end. The adhesive mass, uniformly-spread, sticks at once, without irritation. Back-cloth is strong, pliable and supportive. Its unfailing dependability has made it the world's leader.



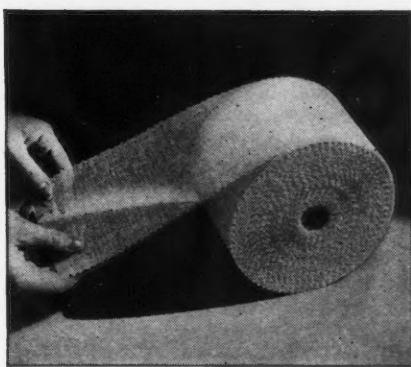
Johnson & Johnson Limited
MONTREAL CANADA

HOSPITAL DIVISION

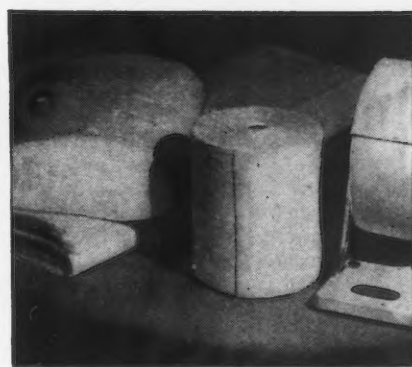


COTTON BALLS

Let us send you samples of the large size for your O. B. work. Close buyers have proved these balls save time and money.



CUT CRINOLINE ... Serrated Edges
Saves time and labor when making plaster-of-Paris bandages. Costs no more than uncut crinoline.



ABSORBENT GAUZE

In bolts, rolls and cut pieces in all standard grades. Known everywhere for its superior whiteness and absorbency.



GAUZE SPONGES

J. & J. Gauze Sponges are uniform in size and shape. They are more economical than hand-made sponges. No raw edges. All standard sizes, which are openable to larger sizes without exposed edges, as illustrated.

character, especially one put out under such auspices, one has a right to expect little short of perfection. However, the book lover will be disposed to forget all this and will plunge eagerly into the wealth of information, wisdom, and story provided in this truly unusual book.

Modern Marriage and Birth Control. Edward F. Griffith, M.R.C.S., L.R.C.P. 221 pages. Price 5s. net. Victor Gollancz Ltd., London, 1935.

This book is something more than another book on contraception. While Dr. Griffith is a definite proponent of birth control, his book is not merely an *ex parte* statement and there is a note of idealism throughout. The titles of some of the chapters: Family Limitation, The Problems of the Engaged Couple, Birth-Control Methods, Sex Communion, The Spacing of Children, Some Male Problems, Abortion, Sterility, and Sterilization indicate the scope of the book. Though frankly written, the book contains nothing to excite the prurient-minded, and newly married or engaged people could read it with advantage. There is a useful bibliography. Although the book is written mainly for the laity there is much in it which might be helpful to doctors, magistrates and social workers.

Speech in Childhood—Its Development and Disorders.

George Seth, M.A., B.Ed., Ph.D., Lately Assistant, Combe Psychological Laboratory, University of Edinburgh, and Douglas Guthrie, M.D., F.R.C.S., F.R.S.E. 224 pages, illustrated. Price \$3.25. Oxford University Press; McAinsh, Toronto, 1935.

This is a valuable addition to the recent literature on the disturbances of speech and the treatment of speech defects. After describing the mechanism of speech and relating it to the different structures that are involved in speech production, the authors describe in considerable detail the disorders of articulation and particularly the condition of stuttering, which, from the standpoint of treatment, is the most difficult form of speech defect. Special chapters are devoted to the relationship between hearing and speech and the various physical conditions which result in nasal speech. Of particular interest is the chapter on the development of speech, in which the various theories of the origin and development of speech are presented. The treatment of stuttering is discussed in considerable detail and particular reference is made to the recent theories on the relationship between stuttering and handedness.

One feels on reading through this book that this subject is so well presented, both from the theoretical as well as the practical clinical points of view, that it should be particularly valuable to the general internist and particularly to the pædiatrician, who is so frequently concerned with the question of speech development and the treatment of the disorders of speech.

The Doctor and the Public. A study of the sociology, economics, ethics, and philosophy of medicine, based on medical history. James Peter Warbasse, M.D. 572 pages, illustrated. Price \$5.00. Paul B. Hoeber, New York, 1935.

The general social point of view held by Dr. Warbasse will be known to those who have read his previous writings. This book is divided into ten chapters, the first having to do with "The humble origin of helping and healing". Here, the author tells of the animal kingdom: "The ants have a regular profession of doctors and nurses who care for the sick and injured. Certain ants have specialists trained in obstetrics". Then follows an interesting account of the development of medicine, the mother of science. Many interesting items are noted, such as the existence of state medicine in China from 1123 to 256 B.C. The second chapter is devoted to the Greek period and influence. Dr. Warbasse describes and comments on the general social condition in

such pithy sentences as: "Political democracy is impossible without economic democracy". Tribute is paid to a few thinkers of the middle ages, in which period the author finds formula worship and respect for authority to be the outstanding characteristics. He remarks that those in commanding places demand respect for authority, and that the masses are apt to require general conformity to formulæ and so discourage individualism—a present-day characteristic also.

Then follow several chapters which recount how new knowledge is constantly acquired. Medical readers will enjoy the historical chapters and will appreciate the comments of the author, but it is in the last third of the book that they will find their real enjoyment. Dr. Warbasse believes that "The economic and social structure of medicine and society is changing", and that "as medicine is practised today, the physician is a business man". He sees medicine as touching all human relationships, and says: "If the 'criminal' is not a sick man, then society is sick". This opens the door to a very frank criticism of present-day society, which he regards as an acquisitive struggle, which means that the rewards go not to those who perform the useful services but to those who speculate with their products. The public demand for medical services must be met. Dr. Warbasse does not view with approval, although he regards it as inevitable, the socialized state as a natural successor to the capitalistic state, which to him would be impersonal and soulless. "Insurance in the interest of health should prove a social advantage". He believes that medicine will be socialized when it is developed as a social rather than as a commercial enterprise. The world is waiting for medical leadership, and the author concludes that "It is better to have new ideas, to institute new methods, and to change the events, than it is to let the events change themselves, force alien ideas upon our minds, and impose upon us methods not of our own desire".

Physical Signs in Clinical Surgery. Hamilton Bailey, F.R.C.S., Surgeon, Royal Northern Hospital, London. Fifth edition, 287 pages, illustrated. Price \$6.25. John Wright & Sons, Bristol; Macmillan, Toronto, 1935.

This book is now too well known to require extensive review. Comment must be made however on the excellence of the numerous illustrations it contains, each with its forcible and well-taught lesson.

BOOKS RECEIVED

Essentials of Psychopathology. G. W. Henry, Associate Professor of Psychiatry, Cornell University Medical School, New York. 312 pages. Price \$4.00. William Wood, Baltimore, 1935.

Melancholia in Everyday Practice. E. L. Hopewell-Ash, M.D., Lond. 136 pages. Price \$2.25. John Bale, Sons & Danielsson, London; Macmillan, Toronto, 1935.

ABC of the Endocrines. Jennie Gregory, M.S. 126 pages, illustrated. Price \$3.00. Williams & Wilkins, Baltimore, 1935.

Manipulative Methods in Treatment of Functional Disease. E. L. Hopewell-Ash, M.D., Bachelor of Surgery, London University. 92 pages. Price \$1.10. John Bale, Sons & Danielsson, London; Macmillan, Toronto, 1935.

Fasciæ of Human Body and Their Relations to the Organs They Develop. Edward Singer, M.D., Department of Anatomy, College of Physicians & Surgeons, Columbia University. 105 pages, illustrated. Price \$3.00. Williams & Wilkins, Baltimore, 1935.

Terminology of Operations of the University of Chicago Clinics. H. P. Jenkins, M.D. 99 pages. Price \$1.00. University of Chicago Press, 1935.